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By Eric Bender

BOSTON — IBM Entry Systems Division President William Lowe hinted at plans for a laptop computer and restated IBM's commitment to open architecture and to Microsoft Corp.'s MS-DOS operating system during a rare public appearance last week.

"There are a number of applications out there which can only be solved with laptop devices," the head of IBM's Personal Computer group told several hundred MIS professionals at the Hammer Forum. "It's an important opportunity for [microcomputers]."

Reaffirming the role of micros in IBM's strategy, Lowe said, "The [Personal Computer]

Continued on page 4

Sperry axes
1100 micro

By James A. Martin

BLUE BELT, Pa. — Sperry Corp. said last week it has abandoned efforts to bring its 1100 series mainframe architecture down to the desktop level and will concentrate marketing efforts instead on its Series 5000 AT&T Unix-based supermicrocomputers.

The company also confirmed that it has laid off a total of 225 employees, mostly in the product development and production departments, but said the two moves were unrelated.

"The strength of [such products as the Series 5000 and the PC/IT-based network], coupled with Sperry's commitment to both long- and short-term enhancement and expansion of these product lines, eliminates the need to produce a micro 1100 product as a desktop 1100 or as an 1100 work group concentrator," according to Michael Maynard, the manager of Sperry

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Amdahl out
with Sierra
competitors

By Jeffry Becker

SUNNYVALE, Calif. — Amdahl Corp. last week countered IBM's February high-end systems announcement with the introduction of three 5880 series mainframes. Amdahl said the systems offer increased internal logic over existing systems with either price or performance benefits over the IBM 3090 family counterparts.

While claiming 15% to 35% better price/performance than the 3090 family competition, Amdahl also reported that the first dual processor in its 5880 series will not be delivered until the second quarter of 1986 and that its four-way processor will not be available until the third quarter of 1987.

IBM delivered its first dual-processor 3090 in August and expects to deliver a four-processor version in late 1986. Amdahl speculated — and company officials would not deny — that the lengthy lag time may be modified (see story page 8).

Along with enhancements to and price cuts for its seven earlier 580 series mainframes, Amdahl introduced the 5880 series mainframes, which include Models 200, 300 and 400. Although both the 200 and 300 are dual-processor configurations with the same 15-nsec machine cycle time, they differ sharply in price and performance.

The Model 200 roughly equals the internal throughput of an IBM 3090 Model 200 and sells for 18% less, according to Amdahl, while the 5880 Model 300 is said to outperform the Big Blue processor by 32% and costs about the same.

The 5880 Model 600, by contrast, provides 30% to 35% more computing power than the IBM 3090 Model 400 for a nearly

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TOP OF THE NEWS

Hewlett-Packard has internally set Feb. 28 as the tentative date for unveiling the newest of its HP 3000 line of transaction-oriented systems, code-named Spectrum, and is keeping developers busy nearly around the clock. The new model, expected to replace the current HP 3000 systems eventually, is a 32-bit reduced instruction set computer architecture system.

Among a host of introductions this week at Localnet '85 in New York, Novell, Inc. said it will take another step in fault-tolerant local-area networks. At a gala event featuring Ray Charles, Novell

will announce mirrored disk-drive capabilities and related network products. Meanwhile, Sytek, Inc. said it will launch the second product in its System 6000 family, a high-capacity dedicated file/print server. Compatible with the IBM PC Network, the 6610 server will provide 75M bytes of disk storage and a 60M-byte streaming tape drive.

A source close to Software AG said that the DBMS and fourth-generation language vendor plans to introduce two new products early next month. The source said the Reston, Va.-based company

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FYI

Fiber optics: Light at end of the network tunnel

By John Dix

If you removed the individual glass strands from all the fiber-optic cables that communications carriers plan to install in the next three years and attached them end-to-end, you could wrap the resultant wire around the world approximately 52 times.

Fiber-optic use in telecommunications networks is poised to explode. Between now and the end of the decade, carriers plan to install roughly 100,000 miles of fiber-optic cable — each with multiple fibers. That is 10 times the amount used to day, according to Bob Holtzman, a market analyst with Kessler Marketing Intelligence, a Newport, R.I., firm that specializes in fiber market research.

Carriers originally installed fiber optics in high-density traffic routes —

such as between Washington, D.C., and Boston — but now are expanding to take advantage of the high-capacity, reliable media and its associated cost benefits.

Last week, MCI Communications Corp. announced completion of a 908-mile Illinois-to-Maryland link that connects its Chicago-hub Midwest network to its New York-to-Washington, D.C., mid-Atlantic network. The company said the linked high-capacity system represents the nation's longest system to date and is capable of carrying 490,000 simultaneous conversations.

Most carriers will lease or sell fiber capacity to large users that need very high-speed digital communications links. The capacity of fiber optics is probably its greatest advantage over alternative transmission facilities. AT&T, for exam-

ple, claimed that by 1988 its fiber network will operate at 1.7G bit/sec., enabling a single pair of glass fibers to support 160,344 simultaneous conversations. At that speed, the same fiber pairs could transmit the contents of the *Encyclopaedia Britannica* in less than two seconds.

New types of services will stem from fiber use. The great capacity will enable carriers to offer high-speed private-line options previously not available, such as 45M bit/sec. channels.

Today few user applications require such bandwidth, but it could make new applications feasible. Host processors could support remote CPUs, high-speed printers or other remote devices as if they were channel-attached locally and

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NEWSPAPER

NEWS

GSA moves to upgrade hardware

By Milton Betts

WASHINGTON, D.C. — The General Services Administration (GSA) has stepped up its campaign to rid U.S. government agencies of obsolete computer hardware, agency officials and analysts said last week.

The GSA is developing a new regulation that will encourage agencies to review and replace the older, critical systems, according to Roger Walker, chief of the policy branch at GSA's Office of Information Resources Management. "We recognize that obsolescence is a precursor to inefficiency," he said.

A proposed regulation that GSA issued in July would have allowed U.S. agencies to use expedited procurement techniques to replace hardware that is 8 or more years old. That proposal is being modified and will be released as a final ruling in the next two to three months, Walker said.

Robert C. Dorman, government market analyst at International Data Corp.'s (IDC) Washington, D.C., division, said GSA has been trying to speed improvement on this score ever since Congress' General Accounting Office (GAO) issued a critical report in 1980.

"In fact, GSA attributes the widespread belief that the government has a serious problem with obsolete computers either to this GAO report or to personal knowledge of an old CPU laboring in the bowels of some agency," an IDC report said.

Earlier this year, GSA reviewed 100 federal data processing systems and their major supporting CPUs and found that only 5% are totally supported by pre-1976 machines, IDC said. The systems GSA reviewed are general-purpose computers that operate major applications systems important to the nation, such as the IBM 3081 that handles agricultural loans and the two Amdahl Corp. 470/V8 units at the Federal Reserve Board.

Furthermore, GSA is sending letters to agencies recommending that specific older systems be considered for replacement, according to Dorman.

DEC profit gain defies predictions

Prime keeps growing, but Apollo, Harris suffer profit losses

By Clinton Wilder

MATNARD, Mass. — Although its profit level still was below that of one year ago, Digital Equipment Corp. outperformed Wall Street analysts' expectations for the second consecutive reporting period with its first-quarter results posted last week.

Another major minicomputer vendor, Prime Computer, Inc. posted a 7% profit increase on a 19% revenue gain in the third quarter ended Sept. 29. The Natick, Mass.-based company earned \$15.2 million, or 32 cents per share, compared with 30 cents per share from continuing operations a year ago. Revenue increased from \$165 million to \$186.7 million.

In another development last week, former high-flying engineering systems vendor Apollo Computer, Inc. reported an after-tax operating loss of \$4 million, as the company previously had indicated, and a whopping \$14.4 million inventory write-down. The combined factors resulted in a net loss of \$18.4 million.

Harris Corp. reported that profits fell approximately 50% to \$12.9 million, or 32 cents per share, compared with \$25.3 million, or 63 cents per share, a year ago. The drop in net income from operations was even greater, as the recently ended quarter included a \$3.9 million, 10-cent-per-share gain from the sale of Harris' power supply division in Miami Lakes, Fla. First-quarter revenue increased slightly from \$511.7 million to \$559.9 million.

DEC earned \$72.3 million, or \$1.20 per share, from operations, compared with adjusted profits of \$80.9 million, or \$1.38 per share, in the first quarter of fiscal 1995. The actual year-earlier earnings of \$144.2 million included a one-time credit of \$63.2 million from changes in federal tax laws.

Revenue grew just 7.2% to \$1.62 billion from \$1.51 billion a year ago, but analysts said improved profit margins owing to cost controls gave DEC a better than expected bottom line. Most analysts predicted DEC's earnings per share would fall in the

80- to 85-cent range.

"Gross margins were the story," said Carol Muratore of Prudential-Bache Securities. "Revenues were in line with our projections, but [DEC] kept costs, inventories and receivables under control. I think costs will stay under control and revenue will continue to grow, spurred by [its] new products."

Marc Schulman of Salomon Brothers, Inc. shared the same sentiment. "[DEC's] earnings were substantially better than I thought they would be," he said. "I was surprised by the higher margins, lower research and development cost and lower selling ex-

tems that are available now, instead of many with different bells and whistles. We're also getting more out of our existing plants."

Analyst Frederic Wittington of Arthur D. Little, Inc. said the higher margins represent the culmination of DEC's return to its core VAX business after less successful ventures in personal computers, retail channels and independent sales forces.

"Everything DEC's announced since the VAX-11/780 has been pointing back to the core," Wittington said.

"It's delivering minis in the way the market wants — network oriented instead of stand-alone. It's concentration on large accounts, sales of entire networks, which mean sales of software, terminals and other add-ons — just like IBM. There is less risk, but perhaps less potential for large return."

Prime turned in its second straight quarter of growth compared with year-earlier quarters, a rare accomplishment in the mini sector this year.

"I think Prime's doing some right things in positioning the company," said Sandra Gank of Cupertino, Calif.-based Inco Corp. "[Prime's] sales and pushing [computer-aided design and computer-integrated manufacturing (CAD/CIM)], and I think [the company] is gaining share."

In a prepared statement, Prime President and Chief Executive Officer, Joe Hennessey, said the firm has increased R&D spending 32% to boost its direct sales force and increased its resources devoted to CAD/CAM applications.

Apollo's \$18.4 million loss, equal to 34 cents per share, was in sharp contrast to year-earlier profits of \$6.3 million, or 20 cents per share. Revenue declined to \$55.2 million in the quarter, from \$57.3 million a year earlier. The net loss wiped out year-to-date profits, leaving the company with a nine-month loss of \$2.2 million, or 7 cents per share, on a revenue increase of 61% over the year-earlier period.

Thomas A. Vanderslice, president and chief executive officer of Apollo, said the revenue decline was primarily caused by slumping domestic demand that has spread throughout the industry and that cost-cutting measures previously announced will lead to improved operating results.

"We're focusing on the set systems that are available now, instead of many with bells and whistles."

— Mark Steinkraus
Digital Equipment Corp.

periences."

DEC's revenue for the period represented a 12% drop from fourth quarter of fiscal 1985 levels of \$1.85 billion, a traditional sequential decline for the company. DEC Vice President and Chief Financial Officer James M. Osterhoff said the company's U.S. sales "continued to reflect the cautious spending of some of our major customers during the quarter." International sales remained strong, particularly in Europe, he said.

Mark Steinkraus, DEC's director of investor relations, said several factors contributed to cost containment, including a manufacturing work force reduction of 900 employees during the quarter. He noted that DEC's newer products, such as the Microvax II, VAX 8600 and Vaxstation, have generally higher margins than older systems.

"We're also stressing modularity and a set systems approach," he said. "We're using existing backplanes, terminals and other components with many different products, and that has far-reaching positive implications for both margins and inventories. We're focusing on the set sys-

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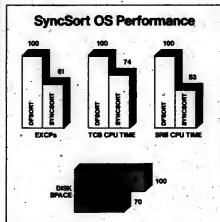
The article "Prime adds power with replacements of 2550, 9650" [CW, Oct. 21] contained incorrect information about the Prime 2655 and 9655. The 2655 is said to offer a 50% better CPU performance than its predecessor and the 9655 a 10% better CPU performance. An upgrade from a 2650 to a 2655 is said to provide a 40% system performance gain. The 9655 is housed in a 5.3- by 26- by 35-in. box. The new systems have a maximum memory of 8M bytes. The 2550 supports four computer-aided design and manufacturing users, while the 2655 supports six. The 9655 supports 128 general-purpose computer users. The company claimed that the processors exceed the speed of the Digital Equipment Corp. VAX-11/780. There is no board-swappable upgrade available from the 9650 to the 9655.

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Analysts downplay divisive effect of IBM Token-Ring

Viable networking alternatives for those who cannot wait

By John Dix

The battle lines have been drawn in local networking, but the war may never rage.

While viewed as extremely significant, analysts said, IBM's introduction of the Token-Ring network two weeks ago will balkanize the network market.

Signaling techniques, media type and access methods aside, "all of the networks do pretty much the same thing," according to William F. Zachmann, vice-president of corporate research with International Data Corp. (IDC), a market research company in Framingham, Mass. "There are some insignificant differences," Zachmann added, "but actual network performance characteristics aren't so radically different."

As initially announced, the IBM Token-Ring does not support the wide range of devices that, for example, can be accommodated by the Ethernet standard. But, analysts predicted, that deficiency will be short lived for two reasons: IBM has singled out the Token-Ring as its general-purpose

office network; and the network's open architecture will cause a frenzy among third-party developers, much as IBM's Personal Computer did.

Users who cannot wait for the Token-Ring to grow up have many viable alternatives, noted Howard Frank, a network consultant in Washington, D.C. "The network field has matured," Frank said. "There are lots of networks that can handle today's needs relatively easily."

Frank said he believes, however, that two standard technologies will emerge: Ethernet type, which a broad cross section of the industry uses, and token-ring networks. "Ethernet is mature and well established now so not to survive," Frank said.

Local networks use different methods to provide the same basic transport service between machines. With Ethernet, for example, each network-attached device chops its data up into packets to be shuttled in both directions across a common cable. Stations upstream and downstream from the transmitting device

listen for their addresses. With token-ring networks, stations that have something to transmit capture an electronic message or token as it circulates around a ring, append data to the token and send it back. The token passes each network station in sequence, and the intended recipient captures the data as it passes.

For all of that, these "technical network differences are unimportant," Frank said.

"They are second-order considerations." More important, the consultant indicated, is network software and the ability to provide device compatibility through higher level protocols.

Even network performance — measured in terms of throughput, the actual rate at which data can be passed through a net — is dictated by software, according to Kim Myhre, director of communications research at IDC. "Most performance limitations are related to software and not necessarily based on the network technology used," Myhre said.

Gauging network performance is a hairy profession that is probably less

exact than processor benchmarks. Every vendor claims his network technology is adequate or better and even compares it with others.

Laura Stuart, director of distributed systems for the Yankee Group, a Boston-based research company, summed it up this way: "If you want a practical network today that offers relatively high performance, Ethernet has clearly demonstrated that capability." If, on the other hand, "you are a large IBM user and know that eventually you want to support a wide [Distributed Office Support System] network or something like that, then the Token-Ring will ultimately make sense," she said.

"It goes without saying that gained additional credence with IBM's announcement of the 4M bit/sec. baseband Token-Ring is the idea of work-group networks. Under this scenario, departmental network clusters will be installed first and then interconnected by a higher speed, higher capacity backbone network. That backbone network will probably be a broadband coaxial cable system like that provided by Sytek, Inc. Eventually, Frank said, fiber optics will supplant coaxial systems.

"If you want to wire a building or campus, broadband is the way to go," Zachmann said. "For the group or local area, take your pick."

From page 1

Fiber optics: Light at end of net tunnel

still have enough capacity to meet other intracompany data and voice needs. The possibilities will develop as the capability becomes reality.

Some users, however, can justify such capacity today. IBM, for example, leases a 45M bit/sec. link from Lightnet to string together 30 of its office and manufacturing sites in Florida. Lightnet is a joint venture owned by Southern New England

Telephone in Connecticut and CSX Corp., a railroad company headquartered in Richmond, Va.

Lightnet has 456 miles of fiber in use in Florida, and in September began construction of 2,000 additional network miles. Scheduled for completion in the fourth quarter of 1986, the total system will include 5,000 fiber miles east of the Mississippi serving 24 states.

Outside of the IBM deal, Lightnet is predominantly known as a carrier's carrier, leasing or selling fiber capacity for use in other carriers' networks.

The firm has five carrier customers today, including Southern Business Systems (now owned by MCI), and U.S. Telecom, a subsidiary of United Telecommunications Co.

Lightnet is unique, however, because it offers carriers and large users alike the opportunity to buy or lease fiber capacity. Customers can lease 45M bit/sec. bandwidth on the network for five or 10 years or buy that capacity condominium style.

AT&T Communications, long the leader in fiber use, said it will have 21,000 miles of fiber in use by the turn of the decade. The company already has three major lightwave systems: one linking Boston, New York, Washington, D.C., and Richmond; another between San Francisco, Sacramento, Calif., and Los Angeles; and a third between Dallas and Houston. These individual systems will be interconnected over time to provide a national fiber net.

At the recent Telecommunications Association conference in San Diego, AT&T Communications' Chairman Randall L. Tobias said the company would lease capacity on existing and planned fiber routes to large users. The smallest link increment will be 45M bit/sec.

In competition with AT&T is National Telecommunications Network (NTN). NTN is a joint venture owned equally by seven partners that was conceived to provide the administrative, marketing and technical coordination necessary to create a national network by interconnecting its owners' regional nets, according to Martin McDermott, vice-president and general manager.

Six of the seven NTN partners — which include Consolidated Network, Inc.; LDI Net, Inc.; LDI Corp.; Mierotek, Inc.; Southernet, Inc.; Southland FiberNet, Inc.; and Williams Telecommunications Co. — have resale arms and subscriber

bases. Resellers traditionally have leased network capacity from carriers like AT&T — which base the price of its facilities on average use — and eked out a living by cramming more users onto the private lines.

NTN originally was created to provide resellers with their own facilities, reducing their dependence on AT&T. Today, NTN has completed construction on more than 2,000 miles — 23% of the planned network. By the end of the year, it expects to have 6,000 network miles in operation. The current \$600 million invested in NTN will finance planned expansion to more than 9,000 miles. Ultimately, McDermott anticipates the network will include 16,000 network miles.

Another carrier with roots in the resale market is U.S. Telecom. This United Telecommunications subsidiary has leased a 35,000-mile fiber net into service by year-end 1988. It will be used to serve three U.S. Telecom arms: Communications Services Co., the reseller that was formerly U.S. Telephone; Corporate Network Services Co., a private network company that was formerly called Inacom; and Data Communications Co., a packet-switch carrier formerly known as Uninet.

U.S. Telecom will buy or build the fiber capacity that it needs to meet its ambitious plans. Besides capacity purchased from Lightnet, the company has already installed 1,700 miles of fiber cable. U.S. Telecom intends to lease smaller-capacity increments than do other carriers, starting at the T1 rate of 1.54M bit/sec.

MCI is not contemplating directly leasing or selling capacity on its planned 7,300-mile fiber network. A company spokesman said the capacity would be too great for most companies. It will use the fiber net to augment present services and to provide integrated services.

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ORACLE Seminar Schedule

Albuquerque	Nov 26	Los Angeles	Oct 22, Nov 19	St. Louis	Nov 14
Austin	Oct 3	Minneapolis	Oct 10	Salt Lake City	Nov 14
Boston	Oct 15, Nov 12, Dec 11	New Orleans	Nov 19	San Antonio	Oct 23
Chicago	Oct 16, Dec 12	New York City	Oct 10, 25, Nov 6, Dec 12	San Diego	Nov 7
Cleveland	Nov 5	Newport Beach	Oct 17	San Francisco	Nov 5
Columbus	Oct 8	Oklahoma City	Nov 7	San Jose	Oct 24
Dallas	Oct 8, Nov 13	Omaha	Oct 24	Seattle	Oct 2, Nov 26
Dayton	Oct 9	Orlando	Oct 15	Syracuse	Nov 7
Denver	Oct 29, Nov 20	Phoenix	Oct 9	Tulsa	Oct 29
Detroit	Oct 22, Nov 12	Portland	Oct 10	Washington	Oct 10, 24, Nov 7, Dec 10
Houston	Oct 31, Nov 21	Rochester	Oct 10, Dec 5	Wichita	Oct 3
Kansas City	Nov 6	Sacramento	Oct 8		

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NEWS

From page 1

Amdahl out with Sierra competitors

identical price, according to David Anderson, director of Amdahl's program products.

The debut of Amdahl's 5890 series of IBM-compatible processors coincided with an 8% to 16% price cut for the firm's seven existing mainframe models and a 32M- to 128M-byte increase in their main memory capacities. Four of the older machines have been expanded from a maximum of 64M to 128M bytes, two from 128M to 256M bytes and one from 96M to 128M bytes.

Consisting of four CPUs, the 5890 Model 600 reportedly executes instructions 70% to 90% faster than the 300 and holds a 10-fold edge in performance over Amdahl's entry-level 5840 uniprocessor. The Model 300, meanwhile, boasts 25% greater processing speed than the Model 200 and 70% to 90% more than the vendor's existing 5870 dual processor.

MIPS ratings

Amdahl Chief Operating Officer E. Joseph Zemke said the company does not rely heavily on million instructions per second (MIPS) ratings to measure CPU performance but did claim that in tests on the assembly line 5890 Model 200 matched the IBM 3090 Model 200 at 27 to 29 MIPS. He said the 5890 Model 300 tested at 36 to 38 MIPS. The 5890 Model 600 tested at 66 to 68 MIPS in single-integer mode and 75 MIPS when partitioned. Amdahl attributes the 5890 family's superior performance over its other seven 580 models partly to a 15% increase in the latest machines' internal logic. "By adding more logic to our existing design, we have cut our cycle times from 23.25 nsec [for the existing 580 processors] to 16 nsec [for the 5890s]," Anderson said. The reduced machine cycle times account for about half of the three latest CPUs' increased throughput.

The rest of the 5890 line's advantage in execution speed stems primarily from a restructuring of the

High-end systems

	IBM 3090	NAS A/S XL	Amdahl Corp. 5890
Relative Performance*	1,320 to 2,361	1,312 to 2,457	1,586 to 4,321
MIPS†	29.32 to 52.7	28 to 50	27 to 75
Processor Price (Assembly Line)	\$4.0 million* (\$4M bytes) to \$8.3 million (128M bytes)	\$4.84 million* (\$4M bytes) to \$8.47 million (128M bytes)	\$4.26 million* (\$4M bytes) to \$8.33 million (128M bytes)
Memory Size in Bytes	64M to 128M	32M to 256M	64M to 512M
Instruction Cycle Time (Nanos)	18.5	Not available	15
Channels	32 to 90	32 to 64	64 to 128
Storage (Shuttle) Size	128K to 256K	256K to 512K	128K to 256K
Price per 1M Byte of Additional Memory	\$12,500	\$11,800†	\$12,500*

* Amdahl's Assembly Line
† IBM's estimated based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158 model 2 running at 4.0.
* IBM's estimated based on vendor-supplied information.
† IBM's estimated based on vendor-supplied information.
* IBM's estimated based on vendor-supplied information.
† IBM's estimated based on vendor-supplied information.

The first dual processor in Amdahl's 5890 series will not be delivered until the second quarter of 1986 and the four-way processor not until late 1987.

mainframes' pipelines — a change that has trimmed the number of machine cycles needed to run a given instruction, Anderson said.

Both of the two smaller members of Amdahl's top-of-the-line processor trio reportedly can be upgraded in the field to the next largest model in the family. But users of the company's existing mainframes — the 5840, 5860, 5880, 5867, 5868, 5870 and 5880 — will have to swap machines if they want to move up to the 5890.

One reason for the absence of a field-upgrade path is that the 5890 incorporates some enhanced technology, including 1,000-gate emitter-coupled logic (ECL) chips and 4,000-bit random-access memory (RAM) packages with 3.5-nsec access times. Existing 580 series CPUs, by contrast, use 400-gate ECL components and slower RAM chips, Anderson said.

Otherwise, all 10 members of Am-

dahl's mainframe line reportedly use basically the same packaging and chip technology.

In addition to lacking a field-upgrade capability from the original seven 580 series mainframes, the largest of the three 5890s — the Model 600 — will be unavailable for shipment for another two years.

The 5890 Model 200 and Model 300 hold 32 to 64 channels and 64M to 256M bytes of main memory, compared with the Model 600, which expands from 64 to 128 channels and 128M to 512M bytes of internal storage.

In a basic configuration, the processors cost \$4.25 million, \$5 million and \$9.33 million, respectively. Although the 600 will remain unavailable until the fourth quarter of 1987, the 300 will begin shipping during the second quarter of next year and the 200 three quarters later.

Amdahl also used its Oct. 22 an-

nouncement to strengthen its mainframe line with several additional product enhancements and introductions, including the following:

■ An enhancement that expands from two to four the number of like or unlike operating systems that Amdahl's existing Multiple Domain Feature can support concurrently on the same processor complex.

■ An Expanded Storage Feature that permits users to add paging store to configurations that are unable to expand beyond 64M bytes of main memory because of operating system constraints.

■ A consolidation of several previously separate VM/Performance Assist Features and a 10% increase in the constituent products' efficiency.

■ Expanded support for Amdahl's High-Speed Floating Point Feature, which, now, for the first time, is available across the company's entire processor family, not just to its three uniprocessor models.

■ A Multiprocessor Coupling Feature that allows the firm's three existing uniprocessors to be combined to form CPU complexes.

Delivery delays may lessen impact of 5890

The performance numbers were impressive, but delivery delays of up to two years will not help as Amdahl Corp. tries to drive further into the high-end IBM market with the announcement of its 5890 series of processors developed under the code name Apache.

That was the immediate reaction from analysts after Amdahl introduced its new product line, which includes what it claimed will be the most powerful IBM 370 architecture processor yet, the four-processor 5890 Model 600, when it is delivered in late 1987.

However, there also was speculation that Amdahl's delivery schedule, with the first dual-processor 5890 Model 300 set for the second quarter of 1986, was scheduled with delivery problems in mind and with the notion that Amdahl could advance those delivery dates if production moved smoothly. Amdahl President John C. Lewis, noting that there might be "a little bit" of complaining from users left open the possibility of earlier deliveries.

Senior Analyst Jeff Canin of Hambrecht & Quist, Inc. said the 5890 Model 600 offers somewhat greater performance than analysts initially expected, performance that he said could be "offset at least a little bit by its delivery lead time." He added, "I believe we'll see an improvement in the Model 600's delivery schedule. But Amdahl, made wary by its previous delays in shipping the 580 machines, probably just wants to play it safe for a while."

A consultant for Framingham, Mass.-based International Data Corp., Steve Josselyn, noted that IBM is likely to react to the Amdahl announcement.

"Obviously, Amdahl had to do something to compete with IBM's Sierra 3900 series at the high end. But I suspect it might be a little late. There are not going to be a lot of people who will wait for an Amdahl like they would wait for an IBM. Also, I

Continued on page 9

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From page 8

Delivery delays may lessen impact of 5890

think IBM is not going to be that much behind in getting something out the door. It certainly can turn up a 3890 Model 4001 to get the performance that the 5890 offers," Jonselyn said.

Aspect of announcement defended

Amdahl officials defended one aspect of their announcement — the notation that existing 5800 series cannot be upgraded to 5890s even though there is a migration path within the 5890 series — by saying that such a performance jump required a new approach in designing the systems. "That kind of magnitude of performance requires a move to a new base. Sometimes technology

just forces you to a new base," Amdahl Chief Operating Officer E. Joseph Zemke said.

Canin, noting that the lack of an upgrade capability was reminiscent of IBM's bar on migrations from the 3080 series to the 3090, said Amdahl has been good about retrofitting its existing systems with the hardware features and software enhancements that accompanied the 5890 announcement.

Jonselyn, however, added that there is a gamble involved for users shifting from IBM to any plug-compatible manufacturer such as Amdahl.

He warned that users hoping to get full performance out of IBM MVS/XA on Amdahl machines are going to lag behind IBM users. "IBM is going to continue to announce enhancements to XA, and those are tough for the

plug-compatible manufacturers to match."

— James Connolly
and Jeffery Becker

Amdahl profits dive despite revenue gain

SUNNYVALE, Calif. — Amdahl Corp. reported Wednesday that third-quarter profits declined by more than half from the year-earlier period, despite a 22% increase in revenue.

The firm said profits were higher in the third quarter of 1984 because of a lower effective tax rate and a one-time tax credit relating to legislative changes concerning domestic in-

ternational sales corporations.

For the quarter ended Sept. 27, Amdahl posted revenue of \$221 million, compared with \$180.6 million a year earlier. Profits for the period just ended were \$4.7 million, or 12 cents per share, compared with the year earlier figure of \$11.2 million, or 35 cents per share.

Pre-tax income jumped to \$6.4 million for this year's quarter, compared with \$2.1 million a year earlier.

Amdahl President John C. Lewis said the company expects shipment volumes to improve during the fourth quarter and anticipates revenue and profits to be higher than the three preceding quarters.

For the nine-month period ended in September, Amdahl's profits stand at just less than \$15 million, compared with \$20.3 million at this point last year.

IBM slashes storage costs

By Glenn Rifkin

RYE BROOK, N.Y. — IBM last week reduced the purchase prices for selected models of its 3890 disk drives and 3890 cache storage controllers by an average of 10%. Prices for the 3890 Model E were reduced 10%, and the cost of upgrading a 3890 Model D to a Model E was cut 5%.

"They are trying to make the product more price attractive in the market," said Tom Henkel, an analyst with the Yankee Group, a Boston-based market research firm. "It's interesting because (IBM has) virtually no competition right now from the PCMs [plug-compatible manufacturers] for these devices."

An IBM spokesman indicated that the price cuts, which are targeted for current products, are part of the company's "normal business practice to pass along improvements in price/performance to our customers."

According to the announcement, the price of a typical configuration, or string, of four 3890 Model E controllers was lowered from \$405,940 to \$416,900. This string consists of one Model A24 and three Model B24s.

Prices were also reduced by 10% for 3890 Models 21 and 23 storage controllers, and a 12% to 17% reduction was announced for upgrading Models 1 and 3 to selected models of the 21 and 23. In addition, prices were reduced 11% to 15.5% for upgrading Models 11 and 13 to selected models of the 21 and 23.

For example, the purchase price of a 3890 Model G23 32M-byte cache control unit was lowered from \$263,750 to \$237,400. The price to upgrade a 3890 Model 3 to a Model E23 was decreased from \$123,480 to \$105,130.

"It's possible that the devices weren't selling quite as well as IBM wanted, but there are no statistics to back that up," Henkel said. "INAS Corp., Storage Technology Corp. and Amdahl Corp. all announced their intent to provide dual-capacity disk drives, but none of them are shipping yet. IBM, in terms of direct access storage devices, has left the PCMs in the dust. They probably just want to make the units more attractive."

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Since that manual doesn't show you how to use the statements in production jobs, you'll probably have to turn to the VSE/Advanced Functions System Management Guide for more help. Unfortunately, this guide isn't organized for easy reference. And again, you'll have to sift through a lot of facts that don't apply to you.

Now, a JCL text designed for do-it-yourself training

You have another option, though. You can read pages 72-106 of a book called DOS/VSE JCL. That section covers the basic JCL statements you'll use for almost every job you run.

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Or, you can read pages 61-68 in DOS/VSE JCL.

Next, you have to learn the JCL to compile your program. That's in the IBM

DOS/VSE COBOL Compiler and Library Programmer's Guide.

Or, you can find what you need on pages 299-304 of DOS/VSE JCL.

You also need to know about the spooling system, VSE/POWER, to use and know how the system will handle your compile. That's in the VSE/POWER General Information Manual. To control how POWER schedules your job or what it does with the job's output, you need to learn to code POWER JCL (job entry control language). That's in the VSE/POWER Installation and Operations Guide. Finally, you need to know how to transfer your job stream to POWER from ICF and how to get it output at your terminal. That sends you back to the ICF manual.

Or, you can read the section on POWER in pages 158-208 of DOS/VSE JCL.

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NEWS

Probes turn federal spotlight on software piracy issue

By James A. Martin

SAN FRANCISCO — The first federal criminal charges in a software piracy case, according to investigators and legal experts, may reflect a new weapon for vendors who until now have had to rely on civil litigation to resolve what the industry says is a costly and growing practice. A five-count indictment, including charges of misdemeanor copyright infringement and unauthorized distribution, was filed recently against a defendant who allegedly pirated two copies of a court-reporting software system more than two years ago.

The charges come in the second recent case of alleged piracy to draw attention from federal investigators. *Computerworld* reported recently (CW, Oct. 14) that the Federal Bureau of Investigation is probing a piracy case in Philadelphia and New York.

The federal charges are a welcome change in terms of effectively combating software piracy, according to David B. Sturtevant, senior director of public communications for the Association of Data Processing Service Organizations (ADAPSO).

"In terms of showing that this is a serious problem and not to be treated like jaywalking by the federal government, this can only serve to strengthen the industry in this area," Sturtevant said.

Reflects growing government trend

Sturtevant said the case reflects a growing trend in which the federal government, realizing the potential economic loss to the industry, has decided to take a strong stance. "A lot of people, ADAPSO included, have done everything in their power to bring it to the [government's] attention. They now recognize this as a pervasive problem in our society, an economic problem that has the potential to eat at the roots of a very important sector of our economy."

It will be crucial for vendors to proceed with legal action in addition to whatever the FBI or the U.S. attorney's office might be doing, Sturtevant said, to send as strong a message as possible to potential pirates.

Federal criminal charges were filed in late September in U.S. District Court against Thomas Taylor, who reportedly reproduced and distributed at least two copies of Cimarron 4.0.3 software, authored by Stenograph Corp. of Skokie, Ill. Taylor apparently acted alone and was not identified with any company in the suit. No further information on the defendant was available.

The five counts against Thomas include one for allegedly reproducing copyrighted software for "commercial advantage and private financial gain," one count of infringing the copyright of the user's manual by reproducing and distributing the manual, two counts of distributing a diskette containing the reproduced software to two named individuals believed to be court reporters and one count of illegally removing the copyright notice that appears on the software. The suit alleges that these activities occurred between Oct. 1, 1982 and Aug. 29, 1983.

Thomas pleaded not guilty, according to Eb F. Luchel, assistant U.S. attorney in San Francisco. A trial is scheduled for the U.S. Magis-

trate's Court here Dec. 9. The maximum penalty for each count is one year in prison and/or a \$1,000 fine, Luchel said.

"There have been numerous civil lawsuit copyright cases, but I am not aware of any criminal charges having been filed under the copyright act of federal law against software pirates," said Thomas J. Smedinghoff, Chicago-based attorney for Stenograph.

Lee C. Evans, special agent for the FBI in San Francisco assigned to the case, said it was the first such case he was aware of as well.

No civil lawsuits have been filed by Stenograph. The company is awaiting the outcome of criminal

charges, according to Edward H. Kight, Stenograph president.

Stenograph heard from one of its sales representatives in 1983 that an unauthorized copy of Cimarron had been circulated in the San Francisco area, according to Kight. Rather than taking legal action, Stenograph contacted the FBI. Some 18 months lapsed between the time of the initial investigation and the date the charges were filed by the U.S. attorney's office.

"We didn't have any idea how long it would take," Kight told *Computerworld*. "Our primary concern was for the world to know you can't steal software like that. We felt strategically that a criminal action would be

a stronger statement than civil action."

The FBI would not comment on the case while "waiting for legal proceedings to transpire," according to Evans.

Cimarron is marketed by Stenograph as an assembly language court reporting system with Digital Equipment Corp.'s Professional 350 and Professional 380 series of workstations and costs between \$28,000 and \$30,000, according to Kight.

The DEC Professional 350 and 380/Cimarron package includes a built-in protection board, manufactured by Stenograph, which enables the software to be read by the processor, Kight said.

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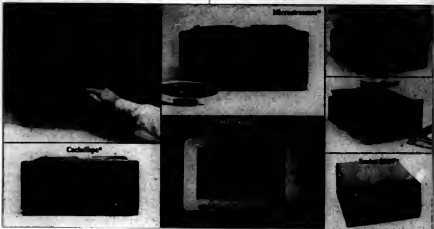
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NEWS

Court dismisses Vault's software licensing suit

Judge cites lack of jurisdiction

By Peggy Watt

NEW ORLEANS — Officials of Vault Corp. in Westlake, Calif., have appealed the recent district court dismissal of their software licensing dispute, which was thrown out of court for lack of jurisdiction.

Federal District Judge Frederick Heede Sr., of Louisiana's Eastern District, indicated that he dismissed the case because neither company involved is headquartered in Louisiana, although Vault filed there partly to take advantage of a so-called

shrink-wrap licensing law that it helped pass. The law states that the provisions in a software package's license is binding if the buyer opens the package.

Vault, which designs copy protection for software, claimed Quaid Software Ltd. of Toronto violated license provisions against decompiling program code when Quaid designed its copy-protection-breaking program, Copywrite. Vault said the only way Copywrite could work against Vault's Prolok copy protection was by reverse-engineering Prolok code. Copywrite allows users to make unlimited backup copies of a program without buying or registering them with the program's developer.

Vault sought an injunction prohibiting further versions of Copywrite that break the latest versions of Prolok protection and up to \$100 million in damages for what it called "bootleg" copies made by Copywrite.

"I don't understand the court's decision, frankly," Vault attorney Jerrell Godfrey said. He said he plans to point out that Quaid sold 510 copies of Copywrite in Louisiana last year and advertised in seven national publications with distributions of 5,000 copies each month in the state to satisfy the court's concern that there was not "sufficient minimum contact" to warrant pursuing the case there. However, he added, Vault may also consider pressing the matter in

another state, notably Illinois, which recently passed a similar shrink-wrap law.

'Jurisdictional issue'

Quaid attorneys called the case "strictly a jurisdictional issue" and said they had not heard about Vault's plans to appeal.

In initial hearings, Quaid countered that its Louisiana business constituted only three-tenths of 1% of its sales.

Godfrey also said the case, while it cites Louisiana's new shrink-wrap law, is "primarily a copyright case." He will next pursue it in the 5th Circuit Court of Appeals and indicated the company was willing to take the issue to the U.S. Supreme Court if necessary.

He said taking the issue to Canadian courts could be complicated because of differences in copyright laws in the two countries.

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TOKYO — Ignoring the adversity of the recession-hit semiconductor market, Toshiba Corp. announced plans to move ahead with production of the next generation in 1M-bit dynamic random-access memory (RAM) chips.

Toshiba, which claims to be the world's first integrated-circuit vendor, will begin volume production of 1-Mbit CMOS dynamic RAM chips at its plant in southwestern Japan next April.

The plant has a monthly capacity of 1 million units, according to Toshiba.

BRUSSELS — The future success of Esprit, the European information technology research program, hinges on increasing its current funding, according to an independent review board that presented its findings here Oct. 18.

The review board, appointed by the Commission of the European Community to assess the mid-term progress of Esprit, also leveled criticism at the European Economic Community's handling of Esprit, a five-year program of information technology research and development involving almost 450 companies, universities and research institutes.

LONDON — The number of companies supplying microcomputers here has jumped a whopping 58% this quarter, and the number of software suppliers increased by 19%.

However, most of the new firms on the scene are merely agents for imported packages and systems, according to a recent survey from the National Computing Centre, a privately funded consulting company in London.

The quarterly survey also revealed that less than one-third of all hardware products available in the UK are actually made by British firms. U.S. products account for 42% of all hardware on sale.

NEWS

Users find IBM's software price increase unjustified

Costs raised too high
without adding value

By John Galtner

Facing price increases on more than 1,100 IBM software products, users last week spoke out strongly against IBM's software pricing strategy.

"The price hike is not justified," said Donald Sitter, director of information services for Lyons Transport Lines, Inc. in Erie, Pa. "What is the reason for such a healthy increase? IBM has not improved the quality of that software. There certainly has been no value added to those prod-

'IBM's higher prices and lower functionality are the reasons I have tried other vendors. As a DP executive, you just cannot afford to be a true-Blue shop these days.'

— Donald Pressley
Oshkosh Truck Corp.

ucts. Other than the fact that IBM wants to improve its bottom line, I cannot understand these price increases."

Sitter's response was typical of the reactions of IBM software users interviewed by *Computerworld* in

"

the wake of IBM's recent announcement of an average 10% price increase on 1,115 applications and utility packages for its medium- and large-scale processors (CW, Oct. 21). In general, users said IBM's software prices are too high and are subject to

increases too often.

Donald Pressley, director of information systems for Oshkosh Truck Corp. in Oshkosh, Wis., said, "IBM is clearly not adding value to its software products at the same rate it is increasing prices. I have some software in use that is no longer even supported, and IBM has increased the price. It is ridiculous. IBM's prices are too high, and they are raised too often."

Users attributed the software price hikes — in February, IBM also increased prices by an average of 7% on a wide range of packages — to Big Blue's attempt to make up for slipping hardware revenue.

"IBM is forced to meet its projected earnings figures one way or another," said Glenn Lukowicz, director of computer services at St. Luke's Hospital in New Bedford, Mass. "Equipment revenue is not going to do it for IBM, so the company shifts gears and gets the revenue where it can. Where it can is in software. There is no doubt in my mind that IBM too often raises its software prices. And those increases are not consistent with the overhead involved in supporting and developing those products."

"Users are living with the equipment that is in place, and they see no need to move to the so-called newer technology, which really is not any different from what they already have. Thus, IBM has had to shift the emphasis to software."

Lukowicz, whose shop has a beta test site for IBM's VSE/SP 2.1 operating system, said software price hikes have a direct impact on his organization's equipment purchases. "Those increases do not force us to forego using software. They force us to pull back on needed equipment, such as printers and terminals, to support our expanding on-line environment. We are forced to second guess as to whether we can afford those things because our software costs are spiraling. We are not getting any more software for the cost, just getting less equipment."

Users said the average 10% price hike would have a real impact when multiplied by the number of affected products in use at their shops. According to Robert Heist, manager of technical services for Carpenter Technology Corp. in Reading, Pa., "Some of IBM's packages are definitely overpriced. If those already overpriced products that I rely on are affected, I am not going to be very happy. That may represent a substantial monthly cost increase."

The price increases have also made users more willing to seek alternative suppliers of software. Overall, users said, independent vendors offer higher quality products at more affordable prices.

"Years ago I just went to IBM and bought software," Sitter said. "But other vendors have made available software that simply works better and costs less."

Pressley echoed those comments. "I use a lot of third-party software. I think I get more value for my dollar. IBM's higher prices and lower functionality are the reasons I have tried other vendors. As a DP executive, you just cannot afford to be a true-Blue shop these days. You have to look around for other sources of software."

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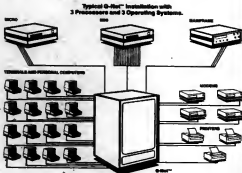
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NEWS

IBM announces wares for fault-tolerant System/88

By Donna Raimond

RYE BROOK, N.Y.—Support for IBM's fault-tolerant System/88 arrived last week in the form of a large range of programming, communications and device-attachment capabilities.

IBM also said that the System/88, announced in February and previously sold on a limited basis, will be widely available by February of 1986 and will be sold through the company's sales offices.

The System/88, which is a Stratus Computer, Inc. fault-tolerant machine, is said to provide uninterrupted service to on-line terminal users in industries that include banking, retailing and manufacturing. The System/88 announcements represent a phased entry into the fault-tolerant market, a spokesman said, noting that IBM has not announced an intention to develop its own fault-tolerant machine at this time.

New programs for the system include Oracle Corp.'s Oracle relational data base management system, which costs \$27,000. IBM is releasing a choice of two operating systems, the System/88 Operating System Release 1 and Release 1.1.

Creating a mystery

In Release 1.1 is Stratus' VOS 4 operating system, released since the original agreement with Stratus. VOS 4 supports both Oracle and the AT&T Unix operating system, according to Omri Serlin of the IBM International Co. research and consulting firm based in Los Altos, Calif. But IBM did not announce any Unix capabilities with its release, creating something of a mystery, Serlin said.

Packages that will enable the System/88 to communicate with multiple System/88s or with other IBM systems include the following:

- **System/88 Network Release 1**—software that connects the System/88 to multiple System/88s—priced at \$7,550.

- **RJE**, which provides binary synchronous data transfer between the System/88 and a variety of other processors. It costs \$3,540.

- **Release 1 of 3270 Terminal Support**, which allows the System/88 to support 3270 devices as if they were ASCII ones. It costs \$4,370.

- **Release 1 of 3270 Emulator Support**, which enables System/88 application programs to communicate with other IBM Synchronous Data Link Control (SDLC) protocols as a 3270 device. It costs \$5,900.

- **Systems Network Architecture (SNA) Cluster Controller Release 1**, which allows the System/88 to appear to IBM SNA hosts as an IBM cluster controller. It is

priced at \$8,100.

- **SDLC Protocol Support**, which allows the transmission and reception of data over SNA networks. It costs \$3,300.

Operating system subprograms

Also announced was a variety of operating system subprograms that include modules for transaction pro-

cessing services (\$6,140); a forms management system (\$4,370); X.25 and X.29 networking facilities (\$5,430 and \$1,770, respectively); compilers for Fortran, Cobol, Basic, PL/I and Pascal (\$5,900 each); a text editor (\$2,360); and a symbolic debugging aid (\$1,660).

IBM Personal Computer terminal support is being of-

fered for \$100, as is an SNA 3270 terminal emulation package for Personal Computers that are attached to a System/88. The emulation package costs \$2,200, and it allows the Personal Computer to appear to the SNA host as an IBM 3275 display station.

The announcements represent standard, run-of-the-

mill SNA compatibility, analyst Serlin said. "IBM will definitely make improvements as time goes by to integrate the system more deeply into SNA," he said. The announcement is not good news for Tandem Computer, Inc., however, which up to now has been the heavy competition in the fault-tolerant arena, he added.

You're probably painfully aware that network management isn't just a luxury. It's a necessity.

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NEWS

Focusing on end-user issues can boost DP manager's role

By Peggy Watt

BOSTON — Focus on the end user's needs, and the role of DP manager may shift from overseeing information processing to planning information strategy, IBM strategic planning director Robert Berland promised managers at the Hammer Forum last week.

Users are "the ones with the money and the business problems," Berland said.

He dismissed price and functionality as be-all and end-all factors for users. "It doesn't matter if it's free if it doesn't help the user solve a business problem," he said.

Berland listed a handful of users' red-letter concerns:

- **Ease of use.** "The one interesting thing about ease of use is that you know when you ain't got it," Berland claimed.

Berland cited IBM's "usability lab," which tests documentation clarity and once identified the need for 300 corrections in a single program.

He told the story of one lab participant who, confronted with an unfamiliar keyboard, was reluctant to press the Execute key "until I know who's getting executed."

- **Consistency.** It is not always possible, with different programs having different functions, but it is desirable.

- **Transparency of the MIS department.** Management must support users, but should not be heavy handed, he said. "Security doesn't mean you take control."

- **Interaction between industry and user.** It is encouraged at IBM through a citizens' advisory board that reminds the industry that it does not work in a vacuum, according to Berland. "It's a disservice to come up with an office system drastically different from the [mainframe] data base," especially when the office system accesses the mainframe.

- **Security.** It is "often an afterthought — but it had better not be," Berland warned. He called information "the second most valuable resource in your company," with people being No. 1.

- **Standards.** "The lack of meaningful standards is one of the biggest problems in the industry," Berland noted. The issue is not operating systems but the accessibility afforded by local-area networks and interchange with outside systems. He described networks as the wave of the office computing future: "Even the guy that's stand-alone wants to get to the data base."

Berland warned against letting users expect the impossible. "People are looking for a panacea," he said. "The

kind of application that needs to be done now is not the generic thing out there that is the answer to everybody's problem."

No single solution

Not everyone needs a spreadsheet. The solution may be a very vertical application, or one that is flexible enough to bend to very verti-

cal needs, he said.

The situation is like that of the oil companies who declare, "all the easy oil has been found," Berland said. "All the easy applications have been done. We've got to start working with those end users to find out what application problems are necessary for their business."

As office computing

evolves, so can the MIS manager — to marketing and strategic planning responsibilities — Berland predicted. "Not enough blue suiters"

"There aren't enough blue suiters in the world to go out and market to all your end users," he said. "You are your marketing agent to your own end users."

With approximately 2,000 IBM office computing products available, the MIS manager has a heavy responsibility to keep up on what is new.

For its part, IBM is trying to establish product families to make lines easier for customers to understand and easier for marketers to remember, he added.

HOW TO MAKE A GREAT IMPRESSION AT THE OFFICE

NEWS

From page 1

Sperry axes 1100 micro press relations.

The canceled effort, known as the Orion Project, was apparently Sperry's attempt to develop a top-to-bottom equipment lineup based on the 1100 architecture. The Orion Project was similar in goal to Digital Equipment Corp.'s successful strategy to migrate downward its VAX architecture to

its Microvax products.

"Sperry's Information Systems Group remains committed to the 1100-chip-set-based technology, in particular, and the 1100 product family in general. . . . The 1100-system family remains the primary Sperry EDP mainframe product line both now and in the future," Maynard said.

Sperry has been experimenting with new product areas, mostly on an OEM basis, during the

past six to nine months with the realization that not all of them would come to fruition, observed Gwen Peterson, director of business computer systems for Dataquest, Inc., San Jose, Calif. Recently it dropped plans to remarket superminicomputers being manufactured by start-up Encore Computer Corp.

"They are trying to get into areas relatively new for them, and my sense is that they are going after a lot and then sort of taking the ap-

proach of let the best project win," Peterson said. "My impression is that Sperry is pursuing many different avenues at one time, and it seems unrealistic that all would carry through."

In what the company said is an unrelated matter, a total of 256 employees have been laid off as a result of Sperry's need to "realign the company's organization, modify product strategies and reallocate personnel resources," Maynard said.

Owing to the "challenging conditions of changing technologies and market conditions," Sperry found it necessary to obtain "cost efficiency [in order to] remain competitive," Maynard added.

Of the 256, 130 were product development employees, 70 of whom were based in Roseville, Minn., and 60 in Blue Bell, Pa., Maynard said. These layoffs occurred earlier this month. Subsequently, 125 production or manufacturing workers in Minneapolis were let go.

Maynard said the eliminated positions "cannot be tied to any specific projects" and said it had not been decided if the layoffs would be temporary. "They've been feeling the same pressures as any other computer company as far as having profits where they would like them to be," Dataquest's Peterson said.

With the Hewlett-Packard LaserJet Printer.

Page 3
1985-86 Marketing Report

indicating a lower overall risk than had originally been projected.

Market Penetration

Since introduction in 1976, the product has experienced tremendous growth in all geographic areas. In fact, the only quarter-to-quarter acceptance occurred Q1-Q2 1985, when the rate of acceptance reached as much as the 3.33 copies offered by the leading competitor (See Fig. 2a).

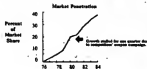
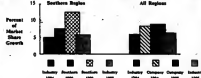


Figure 2a. Market Penetration (all geographic areas)

All regions are contributing to this growth, especially the Southern Region, which is experiencing a growth in market penetration far greater than the industry average. In the last three quarters, the Southern Region has increased at a rate twice that of the same period for the previous year (See Fig. 2b) compared Southern Region and growth company performance with industry growth rates.



This would indicate that the increased effort directed at the dealers in the South has proved successful. No other reasons were shown.

Impact on Profitability

After expenses for the new dealer program, profits have increased 29% in the Southern Region. In the other regions, profits have held steady. This indicates that the ROI for dealers allowed



HEWLETT
PACKARD

AT&T layoff spurs union strike vote

ANAHEIM, Calif. — The Communications Workers of America last week authorized a strike vote by employees of AT&T Information Systems in response to the company's layoff of 24,000 employees. The union charged that AT&T Information Systems was contracting out work in violation of its contract with the union.

"Layoffs in the face of . . . profits and an extraordinary level of both overtime and contracting out is unacceptable. Clearly the work is there," union President Morton Bahr said.

Bahr asked Communications Workers of America members employed by AT&T Information Systems not to work voluntary overtime and cited a letter of agreement from AT&T to the union that states that "traditional telephone work will not be contracted out if it will currently and directly cause layoffs or part-timing of employees."

AT&T Information Systems denied that a breach of its contract with the union had occurred. "We strongly disagree with the position taken. We have fully honored our obligation to the union and are willing to have that position tested in accordance with our contractual arrangements with the [union]," the company said in a statement.

The company said it has devoted considerable resources to relocate employees and find new employment for those whose jobs have been terminated.

— Bryan Wilkins

VIEWPOINT

EDITORIAL

Profits without honor

Critics have recently had a high good time taking U.S. business to task for its shortcomings, particularly as compared with its Japanese counterparts. One point that is often and effectively made addresses U.S. business's preoccupation with short-term financial gain. Too many companies worry too much about the current quarter's stock prices and too little about long-term corporate health.

Viewed in this context, IBM's announcement last week of software price increases and new policies on software licensing (CW, Oct. 21) is particularly troubling. Called by some the most Japanese of U.S. corporations, IBM has long stood for a brand of corporate management that stresses stability and enduring commitment to product lines that serve a marketplace and its customers.

Now, IBM seems to be giving in to pressures from Wall Street to improve its bottom line, whatever the cost. And this from a company acknowledged to be among our best in terms of management and overall financial performance. Third-quarter profits were down 7% from last year; fourth-quarter profits must be boosted by raising prices, the reasoning seems to go.

Perhaps even more significant is IBM's decision to make 262 programs formerly supplied through monthly licenses available for a one-time charge. By allowing users to obtain software for a flat fee, IBM is inflicting a much higher total lifetime income to generate a single year's revenue.

The significance of this shell game for users centers on the question of how IBM intends to balance the pressure to maintain high profits against the equally strong pressure to maintain the integrity of its new products. Can it ensure that products are not rushed through the development cycle—with resulting glitches and bugs—just to begin generating new revenue? Perhaps IBM, that most Japanese of U.S. companies, will manage successfully to do just that. But perhaps too, IBM, that most American of U.S. companies, will fudge quality to boost profits. Caveat, as they say, emptior.

New in CW

On page 107 of this issue of *Computerworld*, you'll find a section headed "New Products" which debuted last week. Although CW has covered new products since its inception 17 years ago, this new format represents an effort to bring together in one place the majority of products that we cover and whose sheer volume—coupled with editorial time restraints—precludes our staff from reporting on them in depth.

In the New Products section, we will provide the essential details of these products along with the address of the vendor to facilitate contact by interested readers. This information has been provided by the vendor and has not been independently verified by CW. Product information that appears elsewhere in CW, including the news pages and technical sections, is the result of reporting by our staff and focuses on the week's most significant product releases.

This reformation of our new product coverage underscores CW's commitment to provide its readers with the best, most thorough and most accessible computer news.



LETTERS TO THE EDITOR

Rules for choosing relational DBMS fail to come up with valid conclusion

E. F. Codd's article "Does your DBMS run by the rules" (CW, Oct. 21) featuring his rules that a data base management system must meet to qualify as "fully" relational is about the silliest article on data base technology I have ever read.

If you follow all of Codd's rules and develop a fully relational DBMS, you are casually informed by Codd at the end of the article that this fully relational DBMS won't be able to handle applications with "severe performance requirements."

I find this a remarkable admission on the part of Codd because most companies' applications are exactly the kind that Codd's relational technology cannot handle. Thus, following Codd's rules would be analogous to building an airplane according to an aeronautical engineer's design specifications only to find in the last chapter that the plane, once completed, will not fly.

It has been Cullinet Software, Inc.'s position for years that what was needed was one DBMS that could efficiently process complex applications with "severe performance requirements," yet still could accommodate end-user applications development easily.

In other words, there are some nice features to relational technology, and for this we are grateful to Codd. However, Codd's articles are really a thinly veiled, self-serving justification for a dual data base strategy, a strategy that has been thoroughly vetoed by the user community as unnecessary. A strategy, I might add, which is the only justification for DB2, the product that evolved from his work while at IBM.

John J. Cullinan
Westwood, Mass.

Constraints suggested for Soviet students allowed to access U.S. computer systems

In Charles P. Lecht's column "On students, computers and the Soviets" (CW, Sept. 9), a number of facts seem to have escaped Lecht's attention.

There is no quid pro quo from the Soviet government for all the education in the U.S. provided for the Soviets' future leaders. The Soviets do nothing in return for us. Yet, this education we provide, especially in computer systems and languages, only

serves to make it more and more likely that they will be able to destroy our country.

Admittedly, the Soviet Union has made great technological strides without the use of any of our supercomputers. Does it make any sense to help them go further along the road to world war?

The sworn aim of the Communist Party is complete domination of the entire world. There is no equivocating this aim; it has guided its every move in every part of the world for the past 70 years. The U.S. should take the following actions:

- Restrict visas to a specific and very small number of Soviet visitors each year and ensure that each one who is admitted has a permanent Federal Bureau of Investigation/Central Intelligence Agency coterie hanging onto their coattails.

- In general, give no more to the Communists than they give to us. And make their diplomats conform to U.S. laws as the U.S. diplomatic corps in Moscow are required to do.

And, as far as providing any assistance in further upgrading their technology, the same quid pro quo should apply to our business executives: Traffic with the enemy is treason.

Walter E. Murdoch
Honolulu

AN/FS Q-7 memory cycle time, dates specified inaccurately in article

Regarding the In Depth article "A walk through The Computer Museum with Gordon Bell" (CW, Oct. 14), the Q-7 memory cycle time of the AN/FS Q-7 was written as 6 msec. I'm not one to quibble about a few milliseconds, but you were off by a lot.

The Q-7 cycle time was 6 microsec., and if the logic were there, the data could have been accessed in 3 microsec. Because my memory is not always infallible, I checked my Q-7 programming manual, dated Nov. 15, 1966, just to be sure. This date brings up another point about the Q-7.

I programmed my first one in early 1957. So I'm pretty sure that there was one as early as 1956.

One last point about transistors: I went to work for Burroughs Corp. in Paoli, Pa., on the first day of 1969 and worked on a computer built with transistorized circuitry. So, they existed as early as 1968 in a computer as opposed to a laboratory.

Edwin S. Heinlein
San Rafael, Calif.

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Vol. 10, No. 20

NOV 1, 1981

AT&T reaches out Tools permit limited exchange between 3B line and IBM mainframes

IBM gives up SBS for 16% of MCI



Crystal Ball
Predict

By Tom Ichniowski
AT&T last week announced an end to its
long-standing relationship with IBM. The two
companies have agreed to a limited exchange
of software and hardware between their
3B and 4331 lines. This move is seen as a
step toward greater compatibility between
the two systems.

By Stephen O'Brien
IBM last week announced a major shift
in its business strategy. The company is
giving up its SBS (Systems Business
System) line in order to focus on its
mainframe and personal computer lines.
This move is seen as a response to the
increasing competition in the market.

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8-10-81

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70. Public Utility/Communications Systems

Transportation

75. Mining/Construction/Production/Refining

80. Manufacturer of Computers, Computer-

Related Systems or Peripherals

85. Computer Service Bureau/Software

Research/Consulting

90. Computer Peripherals Dealer/Computer

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22. Director/Manager of Operations/Planning/Ad-

min. Serv.

23. Systems Manager/Systems Analyst

27. Manager/Supervisor/Programming

Programmer/Networks Analyst

30. QA Mgr./Quality Manager/Supervisor

35. Data Contr./Network Systems Mgmt.

41. Engineer/Scientist/RLD/Technical Mgmt.

Manufacturing Sales Reps./Sales/Marketing

Mgmt.

60. Consulting Management

70. Medical/Legal/Accounting/Management

80. Education/Journalist/Librarian/Student

90. Other _____ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)

Types of equipment used which are personally owned either as a user, vendor or consultant.

A. Mainframe/Minicomputer

B. Microcomputers/Small Business Computers

C. Monoprocessors/Workgroup

D. Communications Systems

E. Office Automation Systems

VIEWPOINT

Performance reviews benefit firm, worker

Frequent, truthful feedback required in appraisal

By John P. Murray
Special to CW

What is the policy of your organization concerning performance appraisals? Are they conducted on an annual basis? Are they administered in a consistent manner? Does your supervisor or manager demonstrate a strong interest in the process? Is the completed appraisal, including the comments of the person being appraised, reviewed by someone at a level above that of the supervisor or manager conducting the review?

Performance appraisals are an important aspect of the process of employee development; therefore, their use should be encouraged and supported by the organization. Properly done, the review can provide significant benefits to both the employee and the manager.

The person who has responsibility for conducting the appraisal should be willing to devote sufficient time and attention to the effort so that the session is not only meaningful but provides a realistic assessment of both the strengths and weaknesses of the individual being appraised. The purpose of the appraisal session should be to offer guidance, encouragement and suggestions for improvement.

Given the correct atmosphere, the formal process associated with the performance appraisal should not produce any major surprises for the employee.

Feedback should be provided as instances of good or bad work occur. Employees deserve to know where they stand at any given time, not just at appraisal time.

This sets a more constructive framework for the formal session. Rather than engage in lengthy discussions about the negative items mentioned in the review, the participants can focus on constructive approaches for the future.

This is the ideal situation. In too many instances, any type of constructive feedback is viewed as being something onerous by the person responsible for the appraisal.

This sets the stage for undue concern for both the manager and the employee as the appraisal nears. There is often so much apprehension on both sides that by the time the session begins, considerable tension is evident. What should be a constructive and positive meeting, unless per-

formance has been poor, is often viewed as a difficult process by both parties.

For some reason, this situation seems to be worst in information processing departments. There is simply too much other work to be done. As a consequence, appraisals tend to be put off.

The real answer is probably found in the aversion many information processing managers have in dealing with the people issues associated with performance appraisals. There is also a reluctance on the part of many employees to seek regular feedback on their work. Perhaps managers and employees alike tend to focus too much on technical issues and too little on people issues.

The performance appraisal must be as honest as possible if it is to be effective. If the employee has done well, it should be acknowledged. If the work has been less than satisfactory, that must also be recognized.

There is sometimes a tendency on the part of the manager to avoid or minimize and to mention only positive aspects of the individual's work. Although that stance may make both the manager and the employee feel better, it does not address the issue and is unfair to the employee. Again, if the in-

formal appraisal process has been correctly handled, negative comments will not be a fatal surprise.

When the appraisal session is finished, the employee and the manager should feel that they have engaged in a fair and candid review of the employee's performance. If the appraisal has been correctly carried out, the employee may not be entirely pleased but should not be surprised.

The review of the employee's performance during the prior period is only one aspect of the review. The session also should be used to develop a set of constructive plans for strengthening identified weak areas and for developing the employee.

The planning for future development should combine the needs of the organization and the employee.

People cannot be expected to improve if they are unaware of their shortcomings. Performance appraisals should be seen as an essential constructive tool that can be used to strengthen employees.

Murray is director of management and information services for Ameri-
can Express Stores, Inc., a Dallas, Tex., division of W. E. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

Computer literacy: rehabilitation or risk?

Government officials in Oregon recently launched a vocational training effort that highlights both the virtues and potential hazards of promoting computer literacy among teenagers.

By Jeffrey Beeler

The program uses 14 personal computers, all donated by a philanthropist, to teach basic programming know-how to some 200 convicted juvenile delinquents in five Oregon work-study camps and two training schools.

The main aim behind the state-run project is undoubtedly admirable: To turn the youthful offenders into responsible, productive members of society by teaching them job skills and work habits that will someday increase their chances of landing desirable employment.

But for all its noble intent, the program still gives pause for thought.

After all, it is a rehabilitation effort that places personal computers, with their vast capacity for privacy abuses, in the hands of kids who have already shown a marked propensity for breaking the law. A corporate MIS director or systems security officer could probably be excused for wondering whether such a program's potential risks surpass its claimed benefits.

The chief danger in Oregon's programming instruction effort is not that a participating youth might misuse the system while under state care. Close supervision of trainee activities and tight controls on systems access can effectively eliminate most opportunities for unauthorized personal computer use.

The main threat, rather, is that one or more participants in the Oregon vocational training program might succumb to the temptation to misapply their new-found computing expertise after they leave state custody.

Precedents for such high-tech juvenile delinquency abound. Trade and general-interest publications alike carry accounts regularly of the misdeeds of teen-age computing enthusiasts who have made a popular game of thwarting information security safeguards and penetrating corporate or government data bases. The term "hacker," virtually unknown outside computing circles only a few years ago, has recently become a mainstay in the lay vocabulary.

Epidemic of systems break-ins

What is perhaps most perplexing about the recent epidemic of systems

break-ins is that most of the crimes are committed by otherwise law-abiding individuals. Youths who would never dream of trespassing on private property or resorting to vandalism in its conventional form apparently feel no compunction whatsoever about intruding into someone else's electronically stored information.

Implicit in much of their misconduct is a modified brand of hacker's syndrome that instinctively dismisses all claims to the private ownership of data.

If a system's security is vulnerable to even the most principled and comparatively benign hackers, imagine the damage that could be inflicted on a data base by computer-savvy, knowledgeable youngsters with malice in their hearts and felonies in their backgrounds.

An Oregon educator, for instance, who he had any misgivings about exposing known juvenile delinquents to easily abused technology, characterized the potential security threat as minimal.

Many of the project's participants suffer from serious learning disabilities

and thus "will never reach a skill level that would make them a threat" to a user's information privacy, according to James Richard, a director in Oregon's State Education Department.

Simple motivational tool

Moreover, he continued, the project's computer training courses are intended to serve more as a simple motivational tool than as a means for producing professional computer programmers.

Maybe Richard is right. Maybe none of the project's participants will ever advance beyond a rudimentary level of computing competence, and maybe they will never give organizations that use information systems a justifiable cause for security-related concerns.

Still, the marriage of programmer training and juvenile delinquency is somehow vaguely unsettling — if only because it reminds organizations of how grievously information security can be compromised by proliferating microcomputers and irresponsible users.

Beeler is West Coast bureau chief for Computerworld.

THE DATA CENTER

The purpose of the appraisal session should be to offer guidance, encouragement and, when appropriate, suggestions for improvement.

INSIDE LINES

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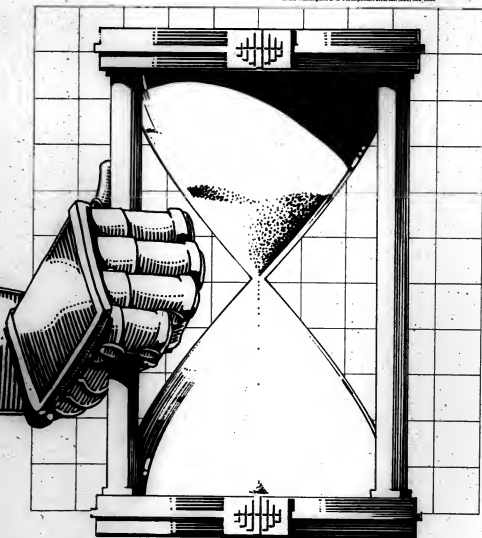


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MICROCOMPUTERS

Microrim's R:Base 5000 out for local-area nets



SMALL TALK
Paul Kozlenowski
City Editor

End of trail for micro pioneers

Steven Jobs' recent departure represents more than a corporate shake-up in a maturing industry. Jobs was one of the last of the micro-computer industry's forefathers still running his company. The list of micro-computer founders now resembles the cast in Agatha Christie's *Ten Little Indians*.

Gone—or at least transformed—are the industry's pioneers. Nolan Bushnell no longer manages Atari Corp. and has essentially faded from sight in the personal computer industry. Jack Tramiel, who once ruled Commodore Business Machines, Inc., has taken his brasserie managerial style to Atari Corp. Adam Osborne, founder of Osborne Computer Corp., has stopped peddling hardware and is pushing software. Gary Kildall has left active management at Digital Research, Inc. for Activeventure Corp., a start-up company exploring compact disk read-only memory applications. George Tate of Ashton-Tate has passed away. Software Arts, Inc.'s Dan Bricklin is attempting to put a second company together as his alter ego Robert Frankston plies his technical skills at Lotus Development Corp.

VisiCorp founder Dan Fylstra is now a consultant, and his company has gone the way of the buffalo. Jobs and company entered an industry where a sound idea backed by good technical expertise and bold marketing could transform an operation housed in a garage into a billion-dollar firm. If in 1984, Jobs had started out from his garage in an attempt to market the Apple Computer, Inc. Macintosh, the machine probably would have failed. In

Continued on page 23

By Eric Bender

BELLEVUE, Wash. — Microrim, Inc. next month will become the first leading vendor of microcomputer data base managers to ship a version fully tailored for local-area networks.

As expected, R:Base 5000 Multisur will run on PC-DOS-based networks, will cost \$1,500 per server and will not be copy protected.

"To monitor on a per-user basis gets to be a real headache," Microrim Chairman Wayne Erickson said. He noted that most micro sets currently support about four people and that "you don't want to have 50 people doing heads-down data entry."

R:Base Multisur supports item-level locking and concurrency control without any operator intervention, Erickson said. Password security also is built in.

The software includes features of the standard single-user version, including Application Express, which helps users develop applications while learning the

system; the CPL language for developing more complex applications; and a compiler, which locks down application code, preventing unwanted tampering.

Most competing offerings for data base management on micro nets have been oriented more toward programmers than toward general users and have been marketed by smaller firms, Erickson said.

He acknowledged that Ashton-Tate once sold a network version of dBase II but pointed out that the product has been withdrawn.

In preliminary tests, R:Base 5000 Multisur looks very positive, said one beta user at a Chicago accounting firm, who is now experimenting with the package on a four-node IBM PC Network for a client.

John Polick, a senior consultant at Friedman, Eisenstein, Raemer and Schwartz, is automating civil service job information at Northern Illinois University. Handling a data base covering roughly

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INSIDE

Borland International unveils a RAM-resident, data base manager/23

ITT Information Systems expands its line of Xtra Communications Technology systems/23

NEW THIS WEEK

■ Kaypro introduces an IBM-compatible Personal Computer
■ Software programs abound for the Apple II series

■ For more on these and other new products, see pp. 107-134.

INSTANT ANALYSIS

"This is a radically different situation; you are now in a position to tell vendors what it is that you want and to make it stick."

—Data General Corp.'s Robert Miller, addressing the Hammer Forum

Rolm announces Juniper II

IBM's Rolm Corp. subsidiary earlier this month launched Juniper II, an upgraded model of its voice/data add-on for the IBM Personal Computer that will sell for \$1,395. Enhancements include compatibility with IBM's Personal Services/PC and Professional Office System/Personal Computer Connection communications programs (with two-way file transfers), support for the Personal Computer AT and pass-through printing capabilities. A future release will provide compatibility with IBM's Token-Ring network, the Santa Clara, Calif., firm said.



Hard-disk system on expansion card bows

Mountain's Drivcard has 20M-byte capacity

By Peggy Weert

SCOTTS VALLEY, Calif. — Mountain Computer, Inc. has gone one-up on the new hard-disk-on-card technology by introducing a 20M-byte hard-disk system on an expansion card, with twice the capacity of an earlier announced competitor.

The Drivcard includes a 34-in. Winchester disk with controller and utilities software for use with the IBM Personal Computer, Personal Computer XT and compatibles, including some Personal Computer AT compatibles, according to Mountain Computer.

The half-slot part of the card fills the nonconnector half of a full card

slot, leaving the connector open for another half-slot. The card can be installed by the user and carries a one-year warranty.

Mountain's suggested retail price is \$1,195. A 10M-byte version is also available for \$995.

Deliveries of the Mountain Drive card system were scheduled to begin this month, just as the Hardcard, a similar product introduced last June by Plus Development Corp. of Milpitas, Calif., was expected to ship.

The Hardcard also offers a hard disk on a plug-in card for IBM Personal Computer compatibles but provides 10M bytes with a controller and file management software and costs \$1,095. It takes up one expansion slot on an IBM Personal Computer or compatible board and can be installed by the user. It also has a one-year warranty.

Mountain's Drivcard utilizes software is optional for the hard disk's operation but allows the user to divide the drive into 11 segments for quicker access and easier backup when only parts of the drive need to be backed up.

Mountain also recently announced its TD-4000 40M-byte tape drive, with versions for external or internal use.

The internal tape system is priced at \$750 and can be installed in the slot for a 54-in. floppy disk drive in the IBM Personal Computer and most compatibles. The external version is used as a separate unit and costs \$995. It can be used in Apple Computer, Inc. computers and some other machines not compatible with the IBM micro.

Both tape drive versions are due to be shipped in December.

CXI graphics board debuts

By John Desmond

CXI, Inc. of Palo Alto, Calif., has announced PcoX/Graphics, an add-on graphics board that provides full IBM 3278 Model 830 emulation for IBM Personal Computers. The board gives microcomputer users access to host graphics and alphanumeric data.

The PcoX/Graphics connection supports the use of graphics programs resident on the host, including SAS Institute, Inc.'s SAS Graph, Isaco Graphic, Inc.'s Dispaly and IBM's GDQM software. Users switch from terminal emulation to Personal Computer mode with a single keystroke.

PcoX/Graphics is intended for use with high-resolution monitors such as

Continued on page 22

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MICROCOMPUTERS

IBM XT clone out in China

SHANGHAI (CWN) — A personal computer compatible with the IBM Personal Computer XT was unveiled recently by one of the only computer manufacturers in the world still lacking such a machine, the Shanghai Electronic Computer Factory.

While XT compatibility may not make the TQ-0520 C a head turner, the machine's features — an Intel Corp.-style 8088 microprocessor, 640K bytes of memory and eight expansion slots — go a

long way toward dispelling the myth that the Chinese are lagging far behind in personal computer technology. No price or plans for foreign distribution were announced.

According to its developers, the TQ-0520 is "100% IBM compatible." More remarkable is the means by which the TQ-0520 copes with the fact that most IBM software is written in English while most Chinese write in Hanzi. The machine supports both English char-

acters and Hanzi's 6,763 characters, though it can only display 40 of the larger Hanzi characters per line.

The machine's developers claim that Hanzi versions of Lotus Development Corp.'s 1-2-3, Micropro International Corp.'s Wordstar and Ashton-Tate's Dbase II and Dbase III are available. Spokesmen for Lotus and Ashton-Tate, however, said that they were unaware of any Hanzi versions of their software.

From page 19

Microrim's R:Base out for local nets

1,500 people looks like "a petal in a garden" for the software, Polick said. He reported no major problems in developing the application on a single-user system and running it on the network.

The software will run on networks conforming to the IBM PC-DOS 3.1 network standard, Microrim said. It will be sold through dealers. Additional license/manual packages will be available directly from Microrim for \$100 per user. A \$600 trade-up package from single-user R:Base 5000 or R:Base 4000 packages also will be offered through the vendor.

From page 19

CXI graphics board debuts

as the IBM 5154 Enhanced Color Display or with the standard IBM 5153 Personal Computer Color Display.

Pcoo/Graphics features a screen-save utility, capable of saving a full 320 graphics presentation space on the Personal Computer for use at a later time. CXI uses noninterlace mode, compatible with the 3278-S32 display requirements of 720 pixels on each of 386 scan lines for high-resolution display in seven colors.

The product is compatible with Digital Communications Associates, Inc.'s Irma board and micro-mainframe software designed for the Irma board.

Pcoo/Graphics is scheduled to be available in November and will cost \$1,996. The Pcoo/File Transfer upgrade costs \$100.

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MICROCOMPUTERS

ITT expands business microcomputer line

ITT Information Systems of San Jose, Calif., has announced two additional models of its ITT Xtra Communications Technology business computer, a microcomputer that can access IBM TSO or CMS mainframe files.

Models III and IV are said to offer communications, by synchronous modem, at speeds of up to 19.2K bit/sec. Model III provides IBM 3278 and 3279 emulation; Model IV provides IBM 3270 Personal Computer emulation. Models III and IV eliminate the need for IBM 3274 and 3276 cluster controllers, the vendor said.

The Model III and IV packages include the ITT Xtra Personal Computer, a single expansion card with modem connector and communications software. Each micro is built around an Intel Corp. 8088 processor and comes configured with a double-sided, double-density floppy diskette, a 10M-byte hard

disk, a monochrome or color display and a keyboard template for IBM 3270 operations.

Model III has 384K bytes of memory and can show up to four windows, either full-screen size or together in various combinations. Model III communicates with the mainframe via one host session. Model IV contains 640K bytes of memory and supports multiple concurrent terminal emulation. Up to eight active windows are available simultaneously. Model IV communicates with the mainframe via one of five host sessions.

Both models include the ability to print screens, save a window to disk and copy data from one window to another.

Communications software allows transfer of both text and binary files.

Model III is priced at \$3,715; Model IV at \$4,280, the vendor said.

Borland offers resource tools

Borland International of Scotts Valley, Calif., has launched a line of resource programs to accompany a new random-access memory (RAM)-resident data base for IBM Personal Computers and compatibles and is shipping another utility program for its Turbo Pascal family.

Turbo Lightning and the Turbo Lightning Library reportedly offer quick access to data base index files stored in RAM, in a similar manner to Borland's Sidekick "helpware" program.

The Random House Spelling Dictionary and Random House Thesaurus programs in the Lightning Library can be accessed by pull-down menus like those in Borland's macro processor, Superkey. For example, a menu will list synonyms for the word marked by the cursor in a document being edited. The user can also add words to the dictionary.

Lightning requires only 64K bytes of RAM, due to a Borland data-compression method, the company said.

Function keys also speed the search, the vendor said.

Turbo Lightning, including the dictionary and thesaurus, will be available in November for \$99.95.

The newest Turbo Pascal utility is a Turbo Editor Toolbox, which includes source code to enable Turbo Pascal users to build or customize editors and word processors.

The \$69.95 utility includes the word processing program Microstar, which Borland said is similar to Micropro In-

ternational Corp.'s Wordstar, and 16 software modules with layered access to streams of text via windows. Editors designed with the Toolbox are compatible with Superkey and Sidekick.

The Turbo Editor Toolbox joins the Turbo Pascal line, which is led by the Turbo Pascal programming language introduced in November 1983 and which also includes the Turbo Database Toolbox, Turbo Graphics and Turbo Networks.

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From page 19

End of trail for micro pioneers

some ways, Mindset Computer Corp.'s machine was similar to the Mac. The microcomputer featured extensive graphics capabilities, received good reviews and could run most IBM Personal Computer software, a feature that the Mac still lacks. Rather than launching a billion-dollar company, the machine took its founders into Chapter 11.

Despite his stature, Jobs will have difficulty launching his new company. The ante is of a higher magnitude than when Apple started. Even established companies, such as Digital Equipment Corp. and Wang Laboratories, Inc., have proven relatively unsuccessful in new micro markets.

The opportunities in standard software applications also may be limited. Ashton-Tate's Dbase II and Lotus' 1-2-3 and their enhanced versions have locked up the

largest portions of data base and spreadsheet markets.

Competitors have had little success in breaking these strangleholds. For example, last year, Analytica Corp., backed by a lot of venture capital, ballyhooed its introduction of the Reflex data base management package. The package made slow inroads, and the company recently was sold to Borland International.

Borland was one of the few companies last year to launch a product successfully. Sidekick, a desktop manager, became a best-seller and was listed as one of the leading software products by a number of publications. Yet Sidekick complements packages like 1-2-3 and could not be used on its own.

Jobs' departure may signify the start of an era dominated by software products like Sidekick and hardware that mimics whatever IBM produces. Surely, there is a place for reliable products like Sidekick, but in the long run users may be the big losers if nothing more dramatic comes along.

With Jobs gone from Apple, the firm will probably be less likely to produce something like the Mac and more likely to go with the status quo. Apple executives now talk of coexistence with IBM, and Apple engineers are working to let the Mac talk to Big Blue mainframes.

Coexistence makes sense from a fiscal standpoint, and many analysts think it is the only way the company can prosper. But if Apple is unwilling to challenge the status quo, what company will?


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SOFTWARE & SERVICES



SOFTALK
John Gallant
City Senior Editor

IBM VM/CMS ascending star

IBM's recent offering of CICS support within VM/CMS (CW Oct. 21) should convince even the most doubting users that VM has become one of IBM's most important software products for the future.

The introduction of CICS/CMS is only the latest major announcement from IBM concerning VM. Already this year IBM has released the long-awaited Extended Architecture (XA) version of VM, an entry-level VM offering for smaller machines and a supported implementation of AT&T Unix System V running as a guest under VM. It would be difficult to pinpoint another IBM software product that has been the focus of such intense development activity in the recent past.

That VM has become such a big name in the IBM stable of software stars is ironic. Born in the late 1960s, VM, much like its oft-mentioned AT&T counterpart Unix, was something of a lesser child in its early days at IBM. All the attention went to other operating systems on which IBM had laid its foundations for the future.

As opposed to being primarily a batch processing operating system, VM/CMS was designed to provide an interactive environment oriented to program development. VM or CP/CMS as it was known then, was designed in two portions. The Control Program component was built to be a very efficient system software core that provided what appeared to be a dedicated computer system for each user — thus the term "virtual machine."

The Conventional Monitor System, known originally as the Cambridge Monitor System, was designed as a VM —

Continued on page 32

Info '85 knocks industry

Nies critical of vendors, outmoded software design

By Deane Rainsford

NEW YORK — The software industry took some heavy punches from a panel of experts at the recent Information Management Exposition and Conference (Info '85) held in this city.

Software design is trapped in the past, a problem that is largely the fault of software vendors themselves, said Tom Nies, chief executive officer of Cincinnati-based Cincom Systems, Inc. Nies spoke at Info '85 on the need to dislodge software from its technological rut to meet the goals of users today and in the future.

According to Nies, software costs continue to rise dramatically, while user satisfaction with systems continues to decrease. "That trend is what triggered [the use of personal computers]," he said.

The accelerating rate of change in end-user requirements means that existing programs must be modified frequently, a situation that leads to overly complex systems, Nies said. And in many cases, the de-

velopment time involved in producing a software package now exceeds the useful life of the product, he added.

Current software systems do not address the major problems that data processing managers face, Nies said. The two most important of those problems include programmer productivity and response time. So-called fourth-generation software, decision support systems and other highly touted packages take up so much memory and are so clumsy in execution that their usefulness is limited, he said. Fourth-generation languages, for example, are useful as development tools in only about one-tenth of all situations, he said.

"We are in a software Bermuda triangle," Nies said. To escape, software development time must decrease from the current average of 18 months to two or three months. Most changes made to software occur at the end of the development cycle, when they are expensive to implement.

Continued on page 30

Burroughs MCP/AS bows

By James A. Martin

DETROIT — Among a series of software announcements for its A series mainframe computers, Burroughs Corp. announced MCP/AS, a new version of its MCP operating system that extends address space.

MCP/AS can address 246 bytes of main memory. MCP was limited to a 64M-byte address space. The announcements, contained in A Series Software Release 3.6, are aimed at providing improved system performance and productivity, extending workstation integration facilities and adding continuous processing capabilities.

According to William Maclean, Burroughs program manager, "We're trying to improve performance, particularly for the transaction processing environment. We believe that every one of our customers

Continued on page 30

Manufacturing software out

By James A. Martin

ATLANTA — American Software, Inc. announced last week a line of financial, manufacturing and distribution software packages for the IBM System/38.

The MRP/38 and DRP/38 packages are based on American Software's manufacturing and distribution programs, MRP/8 and DRP/8, for IBM mainframes and are the firm's first venture into the minicomputer market, according to Paul Dibono, vice-president of marketing.

MRP/38 consists of eight integrated modules including demand forecasting, manufacturing planning and procurement. The system is said to convert and generate manufacturing forecasts into a master schedule to determine component and raw material requirements. In addition, MRP/38

Continued on page 30

INSIDE

Tandem Computer introduces a security products for its line of processors/38

Arthur Andersen unveils a service aimed at helping clients install packaged applications/32

NEW THIS WEEK

- Landmark enhances the Monitor for CICS
- Hewlett-Packard ports Basic to the HP 3000
- Westinghouse improves Mail-tronic

■ For more on these and other new products, see pp. 107-134.

INSTANT ANALYSIS

"Ada is progressing as swiftly as I thought it would. The perspective of others may be different because they overlooked the difficulty of developing compilers."

— Dr. Jean Ichbiah
Developer of Ada

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from miniframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ Why not Cullinet, ADR or Focus? There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as the standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language — each one painting the user into

its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few dogs nowadays run only IBM mainframes. Why, then, even consider a database solution that runs only on IBM mainframes? Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE are identical.

■ FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ Why not just go with DB2 or SQL/DS? A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware

and operating systems than do IBM's relational products.

■ What about Cullinet, dBase III, Symphony or Framework? PC need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload. ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 6 of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 800-345-DEMS

Burroughs ← → Micros

- B8000
- B2000, B3000, B4000
- B5000, B6000, B7000
- A3, A9, A15

- Apple
- R20/B25
- IBM PC
- XES500
- and others.

There are twelve products currently available to extract Burroughs mainframe data so that it can be used in LOTUS, dBase, MultiPlan, dBase III, and other microcomputer software packages. Michael Stanbury and Associates, Inc. now offers an analysis of these packages.

The report answers a number of questions including:

- Which packages run on your mainframe
- The differences between the packages
- Data and user security features
- Mainframe resource controls
- Cost analysis.

The Data Extraction Product Analysis is available for \$90 plus \$5 shipping from

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64729 S. Pacific Coast Highway Suite 362 Long Beach, California 90803

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SOFTWARE & SERVICES

Tandem breaks out Safe system security products

Cupertino, Calif.-based Tandem Computers, Inc. has announced the first two in a planned series of Safe system security products for Tandem processors.

The initial products are Safeguard, for users of distributed networks, and Safe-T-Net, a data encryption subsystem. The products are intended to complement the data integrity and networking features of Tandem Nonstop systems for on-line transaction processing.

Safeguard, which works with Tandem's Guardian 90 operating system, provides Tandem network users with

authentication, authorization and auditing services. Safeguard is intended to control access to shared resources in the network including terminals, printers, tape drives and communications lines.

Safe-T-Net is a channel-attached peripheral that provides encryption, message authentication and an on-line master key change mechanism. The initial product will provide for encryption of terminal sessions on IBM 3270 terminals and IBM Personal Computers with encryption capabilities and for general purpose encryption with a file system interface. The encryption is performed in compliance with the National Bureau of Standards Data Encryption Standard algorithm.

Safeguard, to be available in mid-1986, costs \$1,000 plus \$760 per month for Nonstop II and Nonstop TXP systems.

The initial licensing fee for Safeguard on Nonstop EXT systems is \$500 per system plus a monthly fee of \$380 per system.

Safe-T-Net is available now for \$38,000.

Prime decision support tools out

Prime Computer, Inc. of Natick, Mass., has unveiled a set of decision support tools designed to work in conjunction with its Information data base management system. Prime also announced correspondence management software for its 50 series processors.

Prime's Information Connection package for the 50 series is said to enable users to manipulate data drawn from Information data base files through word processing, spreadsheet and graphics functions. Information Connection consists of the following three components:

- Word Connection word processing software.

- Financial Connection, a spreadsheet that supports mathematical, trigonometric, statistical and financial functions.

- Graph Connection graphics software offering a variety of standard templates with which users can create line, bar, pie or scatter charts.

Information Connection will be available in December at a price of \$9,000 for office environment computers and \$13,500 for computer room systems.

The Prime Correspondent correspondence management system is being marketed by Prime through an agreement with the software's developer Selkirk Associates. It integrates data management, word processing, mail-merge and calendar management capabilities and allows users to track and schedule projects and generate personalized correspondence, the vendor said.

The Prime Correspondent system will be available in November at \$12,000 for office systems and \$20,000 for computer room systems.

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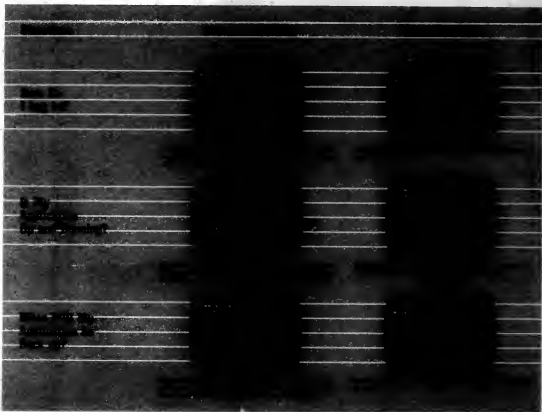
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A-95

ONE THING VT200 IMITATORS CAN'T BEGIN TO IMITATE.

In a world full of imitators, it's an easy mistake to assume that any terminal that looks like a VT200™ will perform like a VT200. After all it's no major task to imitate the most superficial features of a video display terminal.

But there's one test of a video terminal that simply can't be judged in a 15 minute demonstration.

The toughest test of all. The test of time.

While other display terminals were designed to impress you in the showroom, Digital's VT200 was designed to imitate a

more lasting impression. To keep you comfortably productive years down the road.

That's what inevitably separates an industry standard from the rest.

And why so many professionals return time and time again to products with the Digital logo.

THE DIGITAL LOGO MEANS LONG TERM PRODUCTIVITY.

It's no coincidence that the VT200 family was designed by people who are the end users at

in front of display terminals day in and day out. They've discovered the shortcomings, the idiosyncrasies and all the subtle little problems that can end up robbing you of productivity.

As a result, some of the VT200's best features are ergonomic. The angle of the screen. The sculpture of each key. The design of the keypad.

These are the things that become most apparent after hours of prolonged use. And often spell the difference between a terminal that's a genuine productivity tool and one that's—quite literally—a pain in the neck.

The fact is, the VT200's ergo-

nomie design and the resulting ease of use were two of the reasons it won the International Design Award, in both 1983 and 1984.

THE DIGITAL LOGO MEANS LONG TERM COMPATIBILITY.

Whether you're looking for a terminal for your VAX™, DECsystem or PDP-11™ based system, the VT200 has a rather obvious advantage over any other terminal you might consider.

We built the host. As well as the other peripherals you'll be using.

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So it only makes sense that our video terminals are substantially more compatible up and down the Digital family line. Each new generation, for example, brings with it all the important elements from previous generations. Which is why you'll find some of our customers using 10 year-old VT52™ terminals with brand new VAX systems. The simple fact is, Digital has always been committed to protecting your investment with every move you make.

In addition, our breadth of product line means Digital can provide you with a total solution. Hardware, software and peripherals. And while single sourcing is not an end in itself, it certainly provides an extraordinary measure of convenience, compatibility and reliability. Particularly when the single source is Digital.

THE DIGITAL LOGO MEANS LONG TERM RELIABILITY AND SUPPORT.

When asked to single out the strongest feature of Digital's video terminals, many users point to the most visible asset of all: Durability.

Over the years, we've heard some pretty gruesome stories about the ordeal our terminals have endured. Like coffee that was spilled on keyboards. Or cables that were inadvertently ripped from their ports. They've even survived trial by fire. While it's unreasonable to expect even the toughest video display to come through every major trauma unscathed, it's comforting to know your terminal has a reputation for survival.

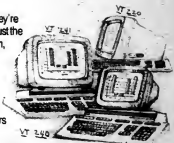
It's equally comforting to know you've got a support team behind you every step of the way. A support team rated the best in

the business by users. They're there for everything. Not just the repairs, but system design, training, updates, education and seminars. All to make sure you get the absolute maximum from your video terminals. Today, tomorrow, and years down the road.

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SOFTWARE & SERVICES

From page 25

Manufacturing software out

38 determines whether resulting production and purchasing decisions are feasible, based on the master schedule, and provides more accurate shipment date expectations.

D&P/38 helps an organization provide proper customer service levels while maintaining inventory investment and other costs associated with distribution.

Costs for the systems, which are currently available and can be purchased separately or as a package, vary depending upon the combination of modules chosen. A system containing one functional area is \$40,000, whereas a combination of systems can range from \$200,000 to \$300,000.

From page 25

Burroughs MCP/AS bows for A series

needs one or more of these features."

Users of A Series Software Release 3.5 and Burroughs' Beta Management System II data base management system, can upgrade to MCP/AS without recompiling programs. The expanded memory addressing capability is said to improve overall system performance. Because MCP/AS is now in beta test, the vendor said, no comparative benchmark figures for performance were available.

Memory Disk, an additional feature for MCP and MCP/AS, enables users to designate up to 120M bytes of system memory as disk storage. Programs can interact with the Memory Disk unit as they would a disk drive but at a faster speed, the ven-

dor said. MCP/AS is priced from \$6,188 on the A 3 mainframe to \$202,500 on the A 15 Model M four-processor mainframe. (All prices are for four-year licenses.)

Also announced were the Intelligent Distributed Editor (IDE) and the Test and Debug System (TADS) features, which are aimed at improving programmer productivity. IDE distributes editing and other programmer functions among Burroughs workstations, including the ET 2000 intelligent workstation or the B25 microcomputer.

TADS provides programmers with a high-level, symbolic debugging facility said to reduce the time required to find and correct errors in application programs. IDE and TADS work with Cobol 74, Fortran 77 and Algol languages. IDE is priced from \$1,560 on the A 3 to \$10,800 on the A 15.

TADS is priced from \$2,080 on the A 3 to \$7,200 on the A 15.

Prints and Reprints, two new products, are for managing printing resources and print requests. Prints control printing of data forms for on-site printers. Reprints extends the same functions to remote printers. Prints is bundled with MCP/AS; Reprints is priced at \$3,120 for the A 3 and \$10,800 for the A 15.

Infowire II offers a multivindow capability for EBC and T2000s. Infowire II supports up to five mainframe windows and one local microcomputer window concurrently. Features such as cut and paste across windows are included.

Infowire II is priced at \$198 per copy for up to 20 copies and \$40 per copy thereafter.

A Series 3.5 software is scheduled for December availability.

From page 25

Experts at info knock software industry

Modifications, Nies said, should be made during the design stage, when they are relatively inexpensive to implement.

What is needed is a new mind-set, Nies said. Software developers must change their approach to building software, he said.

"We don't progress in software," Nies said. "The term 'generations' that is applied to software development is a hoax — [the products] are merely enhancements or improvements to products that have been around for years." The oldest concept is the reliance on compilers, which are hopelessly obsolete, he said.

Shaku Atre, president of Atre International Consultants, Inc., also chided software vendors during the session. She said software marketers subscribe to the theory that, if they cannot dazzle the user with technology, they can at least confuse them with buzzwords.

Those buzzwords add confusion to an already mystifying array of products, she said.

IBM has about 25 incompatible operating systems, Atre said. That makes software development more and more difficult. And personal computer users are repeating a mistake already made in the mainframe arena — using more and more disk space.

Three or four software packages, including a word processing package and a spreadsheet, should be sufficient for most personal computer users, Atre said. Some of the solutions to the microcomputer software confusion are fairly simple, she said. Users need a single interface for the few software packages they will use so that they do not have to remember the mnemonics of different packages. Lightening the tone of the package somewhat, Philip Ross Jr., director of research and development at Management Science America, Inc. predicted that in 20 or 30 years, new software technologies will meet all user needs and be transparent at the same time.

The growth of networks will make computing much easier, Ross said. Soon the micro-to-mainframe link will be like using a telephone line, where users push the right buttons and get what they want without having to know from where or how the data is coming.

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State, City	Date	Database Management System (DBMS)	Information Center Management System	Applications		
				Manufacturing	Financial	Human Resources
ALABAMA						
Montgomery	12-4-85	•	•			
ARKANSAS						
Little Rock	1-29-86	•			•	•
CONNECTICUT						
Hartford	11-19-85	•	•	•		•
DISTRICT OF COLUMBIA						
Washington, D.C.	11-26-85	•	•	•	•	•
Washington, D.C.	1-22-86	•	•	•	•	•
FLORIDA						
Jacksonville	11-20-85	•				
Tallahassee	12-5-85	•				
GEORGIA						
Atlanta	10-11-85	•	•	•	•	•
HAWAII						
Honolulu	11-24-85	•				
ILLINOIS						
Chicago	12-4-85	•	•	•	•	•
Chicago	1-17-86	•	•	•	•	•
INDIANA						
Indianapolis	12-11-85	•	•	•	•	•
South Bend	12-5-85	•	•	•	•	•
LOUISIANA						
New Orleans	1-16-86	•	•	•	•	•
MASSACHUSETTS						
Boston	12-12-85	•	•	•	•	•
MICHIGAN						
Dearborn	1-16-86	•	•	•	•	•
MINNESOTA						
Minneapolis	12-12-85	•	•	•	•	•
MISSOURI						
Kansas City	12-13-85	•	•	•	•	•
St. Louis	1-7-86	•	•	•	•	•
NEBRASKA						
Omaha	12-6-85	•	•	•	•	•
NEW JERSEY						
Fairfield	1-14-86	•	•	•	•	•
Princeton	11-15-85	•	•	•	•	•
NEW YORK						
Long Island	1-16-86	•	•	•	•	•
New York	1-8-86	•	•	•	•	•
Syracuse	12-12-85	•	•	•	•	•

State, City	Date	Database Management System (DBMS)	Information Center Management System	Applications		
				Manufacturing	Financial	Human Resources
NORTH CAROLINA						
Charlotte	12-10-85	•	•	•	•	•
Raleigh	1-7-86	•	•	•	•	•
OHIO						
Cincinnati	1-8-86	•	•	•	•	•
Cleveland	1-14-86	•	•	•	•	•
Columbus	12-12-85	•	•	•	•	•
OKLAHOMA						
Oklahoma City	12-3-85	•	•	•	•	•
PENNSYLVANIA						
Philadelphia	11-28-85	•	•	•	•	•
SOUTH CAROLINA						
Charleston	11-26-85	•	•	•	•	•
TENNESSEE						
Chattanooga	12-18-85	•	•	•	•	•
Knoxville	11-20-85	•	•	•	•	•
Memphis	12-3-85	•	•	•	•	•
TEXAS						
Amarillo	12-4-85	•	•	•	•	•
Austin	12-12-85	•	•	•	•	•
VIRGINIA						
Lynchburg	12-17-85	•	•	•	•	•
WASHINGTON						
Seattle	12-12-85	•	•	•	•	•
WISCONSIN						
Milwaukee	1-15-86	•	•	•	•	•

CULLINET SEMINARS/CANADA FALL/WINTER 1985

Province, City	Date	Database Management System (DBMS)	Information Center Management System	Manufacturing	Financial	Human Resources
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Calgary	1-16-86	•	•	•	•	•
Edmonton	1-15-86	•	•	•	•	•
BRITISH COLUMBIA						
Vancouver	1-13-86	•	•	•	•	•
Victoria	1-14-86	•	•	•	•	•
MANITOBA						
Winnipeg	11-28-85	•	•	•	•	•
ONTARIO						
Ottawa*	12-12-85	•	•	•	•	•
Toronto	11-28-85	•	•	•	•	•
QUEBEC						
Montreal	12-10-85	•	•	•	•	•
Quebec	12-18-85	•	•	•	•	•
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Regina	12-1-86	•	•	•	•	•

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SOFTWARE & SERVICES

Arthur Andersen offers software aid

Arthur Andersen & Co. of Chicago recently introduced a service designed to help users install packaged applications software.

As part of its minicomputer- and mainframe-oriented Application Software Information Service, Arthur Andersen has entered into agreements with Management Science America, Inc. (MSA) and McCormack & Dodge Corp.

The applications vendors will supply their products to Arthur Andersen's Advanced Systems Development Centers in Chicago and New York to provide Arthur Andersen personnel with training in the installation and use

of the products. Other Arthur Andersen offices will be connected to the centers via leased lines.

A spokesman for Arthur Andersen said consultants for the Application Software Information Service will provide clients with functional and technical guidance in the installation and use of packaged applications. Beyond MSA and M&D, the spokesman said, Arthur Andersen plans to seek the participation of other leading applications vendors.

In the minicomputer market, the program will initially focus on Arthur Andersen's line of IBM System/38 applications.

From page 25

IBM VM/CMS ascending star

operating system, working under the control of CP, that provided an excellent development environment. CMS featured a powerful on-line editor and supported standard compilers.

But in VM's youth, machine cycles were costly, and interactive processing ate up more cycles. Thus, users tended to go with the more efficient batch processing systems and VM was provided at no cost — and with no support — by IBM.

Over the years, VM slowly but surely continued to win over users. In 1972, rumor has it, an IBM official attended a meeting of MVS developers who tried to convince him that VM should be killed and not released as a supported product. But when the official toured the development facility, he found that the MVS experts were running that operating system as a guest under VM. The official concluded that if VM was good enough for IBM, it was good enough for IBM's customers. That year, CP/CMS was released as MVS/370.

Targeting other areas

Just because IBM was selling and supporting VM didn't mean that IBM was emphasizing it as a strategic product. The bulk of Big Blue's development dollars was targeted to other areas. In recent years, MVS and its bigger brother, MVS/XA, seemed to be the sole focus of IBM's attention in the operating system arena.

VM still won loyal adherents in programming environments and among users migrating to another operating system. For example, a DGS user moving up to MVS could run both operating systems under VM during the transitional phase. But there seemed to be no clear indication from IBM as to what the future held for VM.

Times have changed, however. Hardware costs have fallen, and interactive processing has taken on a new importance. But IBM's batch operating systems have, at best, marginal interactive capabilities. Not surprisingly, user and IBM interest in VM has grown. VM/CMS provides the interactive facilities that are so vital.

IBM, in response, has moved to strengthen VM — enter VM/XA — and to make more of its mainline programs available for that environment. IBM has really begun to push users toward VM.

Many analysts point a two-pronged operating system strategy for IBM's future. MVS/XA, they said, will remain the workhorse operating system for batch processing. VM, on the other

hand, will become the mainstay of interactive processing, facilitating on-line program development and

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Those pundits who picked VM as the sleeper operating system appear to have been correct.

end-user and distributed processing. Those pundits who picked VM as the sleeper operating system appear to have been correct.

What this seems to portend, then, is that the features and functionality of VM will continue to be bolstered by IBM. The tools and functions VM currently lacks will be supplied in short order, analysts predict, and IBM sales representatives will no doubt be singing the praises of VM to users.

Users who may have questioned IBM's commitment to VM will see little reason to abstain from enjoying its strengths. It is not inconceivable that VM may one day even replace MVS as the flagship of IBM's software fleet. Once the forgotten child, VM appears to be outshining its siblings.

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COMMUNICATIONS

Net standards sought

Westinghouse tries to tie disparate systems together

By Paul Korzeniowski

PITTSBURGH — Paul Sutcliffe understands the problems IBM managers faced in the early 1980s in trying to establish policies for emerging microcomputer technology.

Sutcliffe, senior engineer at the Advanced Product Technology System division of Westinghouse Electric Corp., is charged with formulating policies and choosing products for automation of design and the initial production processes for products his division manufactures. "The factory automation market may not be as large as the microcomputer market, but the challenges are the same," he noted.

Westinghouse, like other large corporations such as General Motors Corp., is un-

dertaking this task despite the fact that fully specified, clear-cut standards will not emerge for at least a few years.

Standards are needed because factories typically are equipped with a myriad of equipment from a variety of vendors. In Sutcliffe's division, there are Sun Microsystems, Inc. 120 workstations; Apollo Computer, Inc. DN390 superminicomputers; Digital Equipment Corp. VAX superminicomputers; Xerox Corp. Star microcomputers; and IBM Personal Computers.

Tying these systems together has proved to be an arduous process of mixing and matching a number of different vendors' products. In 1981, Westinghouse took its first step in this direction when Sutcliffe's division purchased a personal computer local-area network from Davong Systems, Inc.

Sutcliffe said the product was reliable

Continued on page 35

INSIDE

Could released a gateway that connects its Modway local-area network to networks that support General Motors' MAP/84

NEW THIS WEEK

- Versitron offers Fiber-Optic Multiplexer
- Communications Research Group adds Vaxblast to its line of Blast software

■ For more on these and other new products, see pp. 107-134.

INSTANT ANALYSIS

"There will be two network standards: Ethernet and IBM Token-Ring. Ethernet is too well established now not to survive."

Howard Frank
network consultant



DATA STREAM

John Dix
City Editor

Token-Ring here too late?

Late is a relative term. From IBM's perspective, the Token-Ring network it unveiled two weeks ago isn't late. But many users think it is.

Customers needing local networks have been forced to employ stopgap measures — chink the gaps with equipment on short-term lease — or seek alternatives. As an example of the latter, one large university decided last year it could no longer afford to wait for IBM to show its network hand and made plans to install a broadband net.

While the university hasn't signed any contracts yet, the IBM Token-Ring is probably too late and too little for the school to throw away all the planning it has done to date.

Be that as it may, IBM is not really late to market. The local-net industry is still relatively small, with revenues totalling roughly \$250 million in 1984. But history might show 1985 as a pivotal point; many multimillion-dollar network contracts have been signed this year. One company claimed it has a contract to provide a \$16 million, 30,000- to 40,000-port local network to a branch of the armed services.

As announced, the IBM Token-Ring could not hope to compete for such contracts. Indeed, the net does little if anything more than the older IBM PC Network. In IBM's own words, "Both of these [local-area networks] have essentially the same level of announced support." Both connect Personal Computers. The difference is in product commitment and future capabilities.

Continued on page 34

Phone company ditches switch

By Bryan Whitlock

BALTIMORE — It is not often that a local telephone company will pull the plug on a 4-year-old central office switch when it is working fine.

But when the largest customer supported by a switch is considering giving up Centrex service and installing an in-house telephone system to serve 18,000 employees, the telephone company may go to extremes to try to keep its customer.

Chesapeake & Potomac Telephone Co. of Maryland, a subsidiary of Bell Atlantic Corp., last week said it recently announced that it will install a Northern Telecom, Inc. DMS 100 digital central-office switch to serve Westinghouse Electric Corp.'s Defense and Electronics Center, a 16-building complex.

"It's not often that a telephone company will pull out a 4-year-old [ESS] switch when its customer wants something else," commented Sandy Murphy, the project

manager for the defense group's upgrade of telecommunications facilities. "But when you are the largest customer of Centrex service in the area, it really is in the best interests of the company," she added.

Westinghouse's decision to go with Centrex instead of installing a private branch exchange was driven by a combination of costs, Murphy said. "We would have had an administrative nightmare if we had put in our own PBX, especially with the costs of rewiring the entire facility. With the DMS 100 we won't have any up-front costs. The only rewiring will affect existing key sets, which should cause minimal disruption to local operations."

The six-year contract with Chesapeake & Potomac of Maryland is worth several million dollars, according to Westinghouse officials who refused to disclose the total value of the contract. The new switch is scheduled to be operational by December.

Continued on page 34

Harris unveils digital PBX

Switch based on 20-20 tandem already out

By Paul Korzeniowski

NOVATO, Calif. — Harris Corp.'s Digital Telephone Systems Division has released a digital private branch exchange based on the 20-20 tandem switch the company introduced earlier this year.

The digital switch supports integrated voice and data. Although Harris billed the product as a fourth-generation PBX, industry analysts did not. "True fourth-generation PBXs offer distributed networking capabilities, a feature that the Harris product lacks," noted Doane Perry, an analyst at International Data Corp., Framingham, Mass.-based market research firm.

The modular PBX has 1,920 lines, nonblocking for 960 and employs

pulse-code modulation. Features include the ability to group time slots in multiples of two for up to 32 channels transmitting data at speeds of up to 2.048M bit/sec. Port-to-port digital transmission can operate at speeds of up to 64K bit/sec. and each time slot is equipped with a separate signaling channel.

The product supports data transmission that complies with T1/D3 standards over digital multiplexed interface or twisted-pair lines.

The 20-20 PBX is said to be designed to support Integrated Services Digital Network standards and complement AT&T's Software Defined Network. It supports several protocols including IBM's Binary Synchronous and Synchronous Data Link Control, X.25 and asynchronous.

A modem pooling feature enables a terminal or teletext to call up a specific modem or group of modems. The

Continued on page 35

Amdah introduces series of communications tools

By Paul Korzeniowski

Amdah Corp. has decided to increase its presence in the communications market by announcing a series of product families. The Marina Del Rey, Calif., company has added X.25 packet assembler/disassembler (PAD) equipment, statistical multiplexers and a family of modems to its product line.

The 4445 asynchronous X.25 PAD is compatible with a number of packet-switching networks including GTE Teletel Communications Corp.'s Teletel and McDonnell Douglas Network Systems, Inc. Tymnet. The PAD supports up to 16 devices transmitting data at a maximum speed of 9.6K bit/sec. The outbound line works at a maximum speed of 19.2K bit/sec.

A user can send up to 160 packets of information with a maximum of

4,400 characters. The device supports CCITT X.3, X.28 and X.29 standards. Prices for the product range from \$3,900 to \$5,500.

The company's 2500 series statistical multiplexers support up to 16 users sending data at rates up to 9.6K bit/sec. The line works at speeds from 1,200 to 64K bit/sec. There are two models in the product line: non-switching and switching. The switching multiplexer's contention feature permits a number of terminal users to share a smaller number of ports.

The device features either local or remote network control. Individual channel monitoring and diagnostic capabilities include status checks and loop-back tests.

Multiplexer prices range from \$3,100 to \$9,600.

Continued on page 35

COMMUNICATIONS

Gould offers gateway for Modway net

Gould, Inc. in Andover, Mass., has announced a gateway from its Modway local-area network to networks that support General Motor Corp.'s Manufacturing Automation Protocol (MAP), a seven-layer network model.

The Gould product, which is supplied by the company's Industrial Automation division, consists of a CPU board equipped with a Motorola, Inc. 68010 microprocessor and 500K bits of random-access memory, a MAP controller board based on a Motorola VMEbus and a 10M bit/sec. modem board.

The gateway supports transmission speeds up to 10M bit/sec. and is compatible with the latest MAP specification, Version 2.1. MAP standards are in the planning stage and certain layers have not yet been fully approved.

Gould stated that the gateway fully complies with all MAP layers except for the presentation and session layers, which are still unspecified.

Prices for the gateway range from \$20,000 to \$25,000.

From page 33

Phone company ditches switch

The Centrex service will provide both simultaneous voice and data communications, supporting data transmissions at speeds up to 56K bit/sec.

Westinghouse will control moves and changes, least-cost routing, station message-detail recording, and custom calling.

Beside providing for local calling within the complex facility, the DMS 100 will serve as an electronic tandem switch for Westinghouse's nationwide private network. The decision to use the local telephone, company's Centrex service instead of installing a dedicated company facility runs counter to Westinghouse's stated policy of establishing less dependence on local-telephone company and long-distance carrier facilities.

"In this case it was more cost-effective for us, and there were security considerations," commented Glenn Brown, director of public affairs.

Murphy says the Defense and Electronics Center is currently in the process of evaluating what type of dedicated data communications technology it wants to use for its computer-to-computer links.

From page 33

Token-Ring here too late?

IBM's technical journals and statements of direction regarding networking make it clear that the Token-Ring will become the company's primary office communications transport.

Over time IBM will flesh out the Token-Ring by building interface boards for various pieces of its hardware—probably other low-end ma-

chines and processors in the System/34, 36 and 38 family initially—and smooth out the rough edges between IBM systems through software.

Interestingly, IBM is using the open architecture recipe for success for the Token-Ring first discovered with the Personal Computer, not a proprietary method reminiscent of its Systems Network Architecture (SNA), now a de facto industry standard.

The Token-Ring and IBM

Cabling System are tactical weapons, and SNA is still IBM's grand strategy. Networks like the Token-Ring provide basic transport duties far less critical than SNA, duties that are correspondingly easier to replicate with other technologies.

However, nearly every major network company has said it will offer Token-Ring-compatible networks, products and gateways.

A few of IBM's competitors in the computer mart

haven't been so anxious to follow suit. It can't be too long, however, before companies like Digital Equipment Corp. and Wang Laboratories, Inc. give in, just as they did with network architectures.

Regardless of initial capabilities and industry reaction, the IBM Token-Ring network will likely achieve wide industry support as it matures and is enhanced by IBM and others looking to hitch their carts to Big Blue.

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In the property and casualty insur-

COMMUNICATIONS

From page 32

Amdahl modems introduced

The 1000 series modems, a six-product line, can transmit data at rates from 1,200 to 14.4K bit/sec. The low-end device is a 1,200 or 2,400 bit/sec. dial-up modem that costs \$900.

The high-end 14.4K bit/sec. modem was designed for multipoint applications, features trellis-coded error detection and costs \$6,000.

From page 33

Harris unveils digital PBX

30-20 PBX includes an on-line traffic analysis capability. The package includes an automatic least-cost routing feature. A software editor can be accessed from any AS-CII terminal to change networking schemes or data bases.

Prices range from \$400/line to \$800/line and \$350 for each handset.

From page 33

Net standards sought

and beneficial but limited to only personal computers. Once the division's engineers got a taste of networking, they wanted to interconnect larger systems.

So, Sutcliffe examined more flexible broadband and baseband network alternatives before choosing an Ethernet offering from Xerox Corp.

At first, the network connected a few Xerox Stars, some laser printers and a DEC VAX superminicomputer.

Gradually, the department began to add some products such as 500m Corp. file servers and capabilities to the network so that 40 users were on the network in December 1983. The purchase of a terminal server resulted in disaster. "The product's software worked fine in the laboratory, but once we

hooked a number of devices to it, it fell apart," Sutcliffe said.

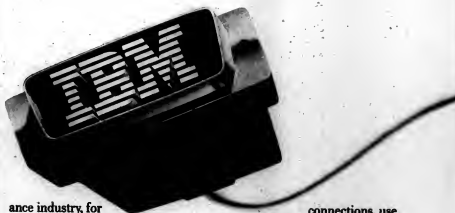
Compounding the problems, some of the network's connections ran off of the end of a Westinghouse power line. Whenever there was a power outage, a common occurrence — the device would stop functioning, and the network would grind to a halt.

An alternative was sought. "We looked at literature from other terminal server companies but only tested the [Bridge Communications, Inc.] offering," Sutcliffe noted. Bridge's CS/100 can serve as a terminal server, cluster controller or front-end processor. It can manage port selection, contention and speeds on an Ethernet

99

"The product's software worked fine in the laboratory, but once we hooked a number of devices to it, it fell apart."

— Paul Sutcliffe
Westinghouse Electric Corp.



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network.

Bridge's CS/100M, a front-end processor, connects 64 terminal sessions from Ethernet nodes to a VAX over a single serial line. Together, the Bridge products enabled users to access any system on the network and transfer data at speeds equal to that system's terminal.

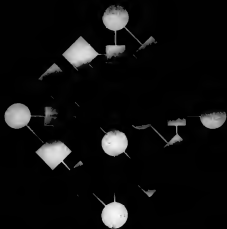
Since the initial Bridge installation, the network has been expanded to include three CS/100 units. The original personal computer network was incorporated into the Ethernet network in July 1985. "Our growth has been a real patchwork process," Sutcliffe noted.

Further expansion

Further expansion is planned, according to Sutcliffe. By the end of the year, 80 users will be attached to the network, a protocol converter will link an IBM 4361 mainframe to the network, and a gateway will link computer users through a packet-switching network.

Although he has not completed a full cost-benefit analysis, the manager believes that the \$60,000 investment has paid for itself.

Sutcliffe would like to expand the network's capabilities from baseband to broadband. "The division could test some IBM Manufacturing Automation Protocol software when it becomes available on the broadband network," he noted. "Gradually, the two networks could be tied together or at least bridged."



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SYSTEMS & PERIPHERALS



HARD TALK
James Connolly
Circuit Sales Editor

Still another niche for IBM

While the computing world focused its attention on the long-awaited Token-Ring local-area network on Oct. 16, 44 other IBM product releases would have been easy to overlook. If you're not a kindergarten teacher, it's easy to miss program announcements such as "Bouncy Bee Learns Letters" and "Bouncy Bee Learns Words."

But one product that stood out in the avalanche of 45 announcements generated excitement in the office automation arena while filling a gap in the IBM product line.

The 3812 Pageprinter may seem like just another printer. It isn't the first 12-page-per-minute printer, or the first to use LED technology or the first to support multiple personal computers on local-area networks or as a shared resource. Its reviews by analysts featured words like "steady" and "solid."

There was more to say, however, because the product was IBM's, even if it reportedly is made for IBM by a New Jersey firm with manufacturing facilities in Japan. The announcement means that IBM has found one more niche in which it can either dominate or influence the market.

The \$7,490 price tag is comparable to and, in some cases, several thousand dollars below the costs for competing printers from Xerox Corp., Ricoh Corp. and Kentek Information Systems, Inc., the company reported to be making the IBM product. In addition, the 3812 is designed to print 18,000 sheets per month and apparently is available

Continued on page 39

IBM printer entry packs wallop in marketplace

By James Connolly

RYE BROOK, N.Y. — IBM's recent announcement of a nonimpact printer for shared-resource or departmental printing was received as an explosive entry that will give IBM leverage in the low-to-medium-volume market.

IBM introduced the 3812 Pageprinter while announcing the IBM Token-Ring network and emphasized that the electrophotographic printer can be used on networks to serve IBM Personal Computers or can be attached to IBM minicomputers and mainframes.

The Pageprinter fits into a low-to-mid-range niche for IBM, as a \$7,490 product printing 12 page/min, well above the IBM Personal Computer-oriented Quietwriter but below the 20 page/min IBM 3820 laser printer.

Using LEDs and a print head containing

gallium arsenide, the Pageprinter prints text and graphics when attached to Personal Computers or to mainframes. However, it only prints to text when used with IBM's System/36 and System/38 minicomputers and superminicomputers.

An IBM spokeswoman said the text-only limitation for the System/36 and 38 was a "business decision based on the fact that text-only fits the applications of the System/36 and System/38 users." She said there were no technical limitations barring development of a System/36 and 38 graphics interface.

"We view it as an explosive announcement. We think IBM did an excellent job of packaging the product at a reasonable price. As a shared printer in a purely IBM Personal Computer environment, it would provide group-level printing at \$1,049 per

Continued on page 39

Multiprocessing fills DP void

By James Connolly

CUPERTINO, Calif. — Multiprocessing, a concept that many in the computer industry relegate to expensive commercial fault-tolerant and scientific machines, may be best used in the everyday commercial data processing environment, filling the void between mainframe and personal computer.

That suggestion — that multiprocessors can run best in the middle ground as distributed processors or departmental processors — was offered by one of the most senior Tandem Computers, Inc. executives, David R. Mackie, after he resigned this month to assume a position with Arctis Systems Corp.

"There are two basic philosophies

about personal computers and mainframes. One is that [personal computers] are going to come up to the mainframe with nothing in the middle. The second is that there will be a middle market there. It's that middle area that I'm of particular interest to me and to Arctis. There has to be something there for [personal computers] to talk to, something to take the load off the mainframe," said Mackie in an interview shortly after he resigned as vice-president for U.S. marketing at Tandem. Mackie, who will become vice-president of marketing

with San Jose, Calif.-based Arctis, joined Tandem of Cupertino from Hewlett-Packard and Co. two months after Tandem's found-

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Mackie joins Arctis in marketing.

INSIDE

DEC releases new models in its Vaxstation 500 line that can connect via Ethernet to other VAX machines and PDP-11 systems/40

NEW THIS WEEK

- Lanpar expands its Vision II terminal line
- Adage introduces a family of stand-alone workstations
- Telaris announces a desktop laser printer

■ For more on these and other new products, see pp. 107-134.

INSTANT ANALYSIS

"IBM is using almost every technology there is for putting marks on paper."

— C. A. Pucko
Associate, Inc.
Steve Pytko on IBM's 3812 Pageprinter

Supermicros signal shift in market function, strategy

Datamedia architecture relieves CPU work load with three processors

By James Connolly

NASHUA, N.H. — Datamedia Corp. has introduced a supermicro-computer featuring a three-processor architecture designed to relieve the central processor of responsibilities.

The Model 1640, Datamedia's second supermicro based on AT&T's Unix, uses three 32-bit, 10 MHz Motorola, Inc. 68000 microprocessors in a tightly coupled configuration. The three processors reportedly split communications processing, file processing and applications processing for networked general computing applications in medium-size and large companies, according to the vendor.

Datamedia, which also sells super-

micros running Pick Systems' Pick operating system, had introduced its first Unix System V-based system, the single-processor Model 1620 in 1984.

A company official said the multiprocessor approach was designed to balance on-line, network and data base functions in departmental computing. He said the overhead associated with communications processing and network management is off-loaded to a dedicated processor, leaving the CPU free to run application code. For data base applications, a separate processor manages files while the other processors run the application code and communications processing in parallel operations.

A typical application would be management of an MIS/DP project that involves multiple branch locations, according to the vendor.

The vendor also said the communi-

Continued on page 39

Wicat strays from general-purpose mart with introductions

OREM, Utah — Wicat Systems, Inc. has announced three supermicro-computers and a strategic shift out of the general-purpose supermicro marketplace.

The company announced replacements for its Systems 150, 155 and 160 Motorola, Inc. 68000-based supermicros. The systems, available Nov. 1, are the Systems 1250, 1255 and 1260. The company said the replacement systems support more users than their predecessors and feature 75% less expensive memory options and 30% less expensive disk storage options. They are said to be more compact configurations with single processor boards replacing up

to four boards.

The three systems fit below what will continue as Wicat's high-end system, the 64-user System 2220.

A spokesman said all Wicat supermicros will be targeted at niches in the market with value-added resellers and distributors selling systems primarily to existing Wicat customers, users of Pick Systems' Pick-based systems, Datapoint Corp. system users and AT&T Unix system developers.

The official noted that Wicat does not want to compete head-on with large, established multipurpose supermicro vendors such as Digital Equipment Corp.

Replacing the eight-user System 150, the System 1250 supports 16 users and is available in a desktop or tower cabinet. It is available with up to 5M bytes of random-access memory (RAM) and 28M to 39M bytes of

Continued on page 39

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SYSTEMS & PERIPHERALS

From page 37

IBM printer entry packs wallop

User for eight users," said Peter Steiner, vice-president of Dataquest, Inc., a San Jose, Calif., market research company.

Steiner said the announcement opens up the competition for the shared printing environment and could force competitors to lower their prices for LED or laser printers. He said one selling point for the printer is the absence of a "click charge," a limit on the number of copies a customer can make without an increase in maintenance costs.

Steve Pytko, vice-president of C. A. Pesko Associates, Inc., a Marshfield, Mass., research company specializing in printers, added, "IBM is setting a new price-performance standard for that class of printer. It's not a highly featured product, but it is solid, steady and very reliable as a shared-resource printer for word processing, distributed processing, spreadsheet, graphics, things like that."

IBM said the printer supports up to eight Personal Computers as a shared-resource printer using an optional \$495 sharing card and directly attaches to either the IBM Token-Ring or PC

Network. It attaches to IBM mainframes under IBM VM, including the 370/158 to the 370/168 and the 4380, 3080, 3080 and 3080 processor lines.

Up to 18,000 page/mo

It was designed to print up to 18,000 page/mo with a resolution of 240 by 240 picture elements. The printer uses two paper cartridges, one holding 550 sheets and another holding 250 sheets, and prints 12 page/min on 8 1/2 by 11-in. cut sheet paper and 9.6 page/min on legal-size paper.

It also prints on sheets of gummed labels. It features 61 standard fonts for Personal

Computers, 54 fonts for the System/36 and 38 and 87 standard fonts or 148 typographic and mathematical fonts in VM environments.

The 3812 Pageprinter will be available in November for Personal Computer and VM systems and in February for the System/36 and 38. It is offered with an optional \$325 printer stand, a 4096 System/36 and 38 attachment, a \$1,900 Pageprinter VM program and a \$49 Personal Computer Pageprinter driver program that is required for each Personal Computer attached to the Pageprinter through the sharing card, according to the vendor.

From page 37

Still another niche for IBM

without a maintenance fee tied to a number of copies.

The market impact is expected to be felt in price cuts by competitors or added features on competing equipment so that non-IBM vendors can justify heavier price tags. The 3812 also places IBM's stamp of approval on LED technology, which requires fewer moving parts than laser printing, a method IBM uses elsewhere in its product line.

The 3812 Pageprinter also represents one more step in IBM's slow trek toward full office automation and integration. It is an endorsement of the concept of shared resources in an office environment, the idea that not every personal computer needs its own high-quality text and graphics printer.

But as usual, IBM left a

few gaps. IBM chose to make the 3812 directly connectable to the controllers in VM mainframes, systems that seldom need 12 page/min printers. The company also allows connections to mid-range systems such as the System/36, System/38 and System/88 but only for text, not graphic, production. IBM's explanation is that the mid-range systems are used primarily for text. The irony is that none of those systems is directly connectable to the Token-Ring local-area network, which is a major selling point for the 3812.

If IBM follows its usual pattern, those gaps will be plugged at some point and for a price. Analysis reports say that a graphics interface for at least the System/36 — one of the keystones in IBM's office strategy — will appear in the future and that at least the System/36 will interface with the Token-Ring at another point.

From page 37

Wicat strays from mart

hard-disk storage. A 1M-byte system with eight ports, a 28M-byte hard disk, diskette backup and Wicat's Multitask Control System or Uniplex+. The System 1260 replaces the 16-user System 160 and supports up to 32 users. It is available with a maximum of 72 bytes of RAM, 80M to 474M bytes of hard-disk storage and two tape drives for backup. A \$25,700 system includes an 80M-byte hard disk, a cartridge tape backup, 1M byte of RAM, eight ports of RAM, eight ports of RAM and the Multitask Control System or Uniplex+.

— James Connolly

and diskette or cartridge backup. It costs \$17,700 with a 28M-byte disk, diskette backup, 1M byte of RAM, eight ports of RAM and the Multitask Control System or Uniplex+.

The System 1260 replaces the 16-user System 160 and supports up to 32 users. It is available with a maximum of 72 bytes of RAM, 80M to 474M bytes of hard-disk storage and two tape drives for backup. A \$25,700 system includes an 80M-byte hard disk, a cartridge tape backup, 1M byte of RAM, eight ports of RAM, eight ports of RAM and the Multitask Control System or Uniplex+.

— James Connolly

From page 37

Datamedia lowers CPU work load

communications processor supports links to multiple hosts using different protocols such as IBM's Systems Network Architecture/Synchronous Data Link Control and X.25.

Each Model 1640 is said to support up to 36 users with a maximum main memory of 12M bytes and a disk capaci-

ty of 572M bytes.

A basic system includes an applications processor with 2M bytes of memory, a communications processor with 500K bytes of memory, a storage processor with 500K bytes of memory, a 52M-byte Winchester disk drive, an 80M-byte streaming tape drive, Unix System V and Datamedia's multitask windowing package.

The system costs \$18,500.

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SYSTEMS & PERIPHERALS

DEC workstations debut

Vaxstation 500 units use Microvax II base

Three Vaxstation 500 family workstations that use the Microvax II as a base have been announced by Digital Equipment Corp.

The Maynard, Mass., company released the V8560, V8565 and V8565 dual-side systems for stand-alone or networked applications that require two- and three-dimensional wire-frame and 3-D color-shaded solids images.

With an Ethernet interface, the Vaxstations can be connected to local-area networks of DEC VAX and PDP-11 computers, a spokesman said.

This arrangement is said to enable the Vaxstations to share resources with other workstations and larger systems, including DEC Vaxcluster systems.

Target applications

The workstations are geared toward electrical and mechanical computer-aided design and earth science applications.

Through network gateways, the Vaxstations can also access networks and computers of other vendors, a spokesman said.

The workstations feature a direct memory access (DMA) interface between the Microvax II computer and the Tektronix, Inc. 4125 graphics subsystem.

The DMA interface provides faster interactive image creation as com-

pared with earlier Vaxstation 500 models that use the serial interface, a spokesman said.

The Tektronix subsystem includes 1,280-by 1,024-pixel resolution, two buffer buffers (expandable to eight), 256K bytes of display-list memory (expandable to 768K bytes) and a palette of more than 16 million colors.

A VSSXX-UC option, available for \$15,060, upgrades the subsystem to display 3-D wire-frame and 3-D color-shaded solids images. The option converts the subsystem to the equivalent of the Tektronix 4128 and 4129 subsystems.

A typical V8560 package costs \$55,080 and reportedly includes the Microvax II with 3M bytes of memory, floating-point accelerator, Ethernet interface, DEC RD53 disk drive, DEC's TK50 1/4-in. streaming-tape drive, a DEC MicroVMS operating system license, the DMA interface and driver and a Tektronix 4125 graphics subsystem. It is housed in a pedestal enclosure.

The V8565 is packaged in a Microvax II cabinet that has additional back-plane and mass-storage slots. A typical configuration costs \$58,080 and has 3M bytes of main memory, DEC said.

The \$73,130 V8565 configuration also comes in the larger cabinet and has the same main memory as the V8565.

It has a standard 8-bit plane, 3-D wire-frame and 3-D color-shaded hardware that is additional on the other two models, according to the company.

From page 37

Multiprocessing fills data processing void in 1974.

In earlier positions with Tandem, a maker of fault-tolerant transaction processors, Mackie had been responsible for technical support and product development. "determining what the market wanted out of a system," he said.

But Mackie noted that the computer market has changed in several ways in the decade since Tandem developed its fault-tolerant systems — systems that he said Arête does not seek to challenge. Arête reportedly has sold about 500 of its 16- to 88-user Series 1000 minicomputers.

Machines' functions redefined

"One thing that happened is that where terminals used to be used at certain levels of the organization where the work was fairly routine, there are now entirely different functions for terminals and [personal computers]. There is a much higher level of interaction with the host, so one needs a system that is very, very strong in the I/O area. It doesn't have to be strong in the compute area," Mackie said.

In that respect — the need to manage a heavy I/O load — Mackie's vision of the multiprocessor's role is similar to the role that Tandem's systems play, although Tandem addresses high-end markets such as financial network management, according to Mackie.

He said the system that fits into

the middle ground cannot adopt the multiprocessor architecture used by supercomputers and the minisupercomputers now reaching the market. Those systems have a single CPU controlling multiple auxiliary processors or I/O processors for work on a single application.

Instead, the departmental or distributed processing system should allow the various users in a department to run their varied applications — the result of the different functions developed in recent years — over different microprocessors within the same system, Mackie said.

"There are a lot of other micro-based systems out there, but they don't spread their operating systems over the multiple processors. Tandem does it, but they are well out of our [Arête] price range," he added.

Future outlook

Mackie said he sees a future where multiple multiprocessor systems routinely fill the micro-to-mainframe gap as departmental processors.

He said those systems will periodically draw down from the mainframe's data base, information that is likely to be used by the microcomputers and terminals as well as periodically update the mainframe with edited files.

A native of the England, Mackie holds bachelor degrees in electrical engineering and business administration. His experience includes nine years of work on military computer systems and four years of developmental work on multiprocessing for HP computers.

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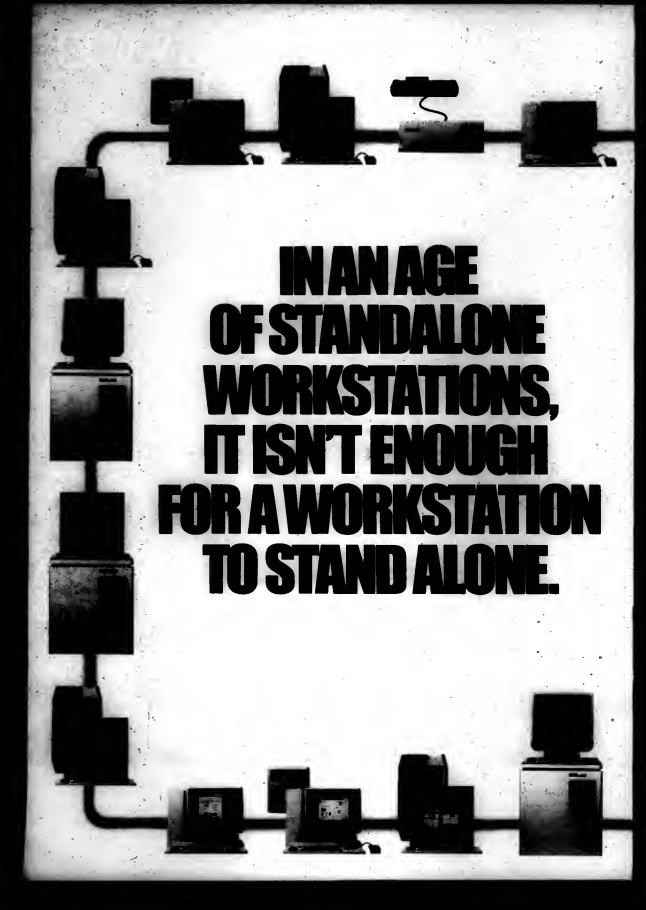
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NEWS



OFF THE PRESS
George H. Harris
Off Publisher Director

PRACTICAL PROJECT MANAGEMENT

By Melvin Page-Jones

When does one general manager equal a dozen technical ones? When that manager is incompetent, says Melvin Page-Jones. The incompetence of one can nullify the productivity of 12.

This book explores managing software development — all the twists and turns that must be negotiated on the way to a successful system. It is the kind of journey that often goes unheralded by the computer industry

press — unless the system falls apart quite publicly.

User management applauds a system delivered by DP on time and on budget.

That's success, right? Naturally the canny project manager learns how to cut the corners needed to turn out a system called "successful" whether or not it will hold up beyond a month or two.

Page-Jones subtitles his book, *Restoring Quality to DP Projects and Systems*. But was there ever a time when quality was the primary criterion on which systems were judged?

Practical Project Management is a promising first publication produced by Dorset House, which was founded by editors and managers formerly at Yourdon Press. An excerpt of this work appeared in the Sept. 30 issue of *Computerworld*.

Paperback, 230 pages, \$28, ISBN 0-832633-00-5, by Dorset House Publishing, 353 W. 12th St., New York, N.Y. 10014.

THE IBM PC IN YOUR CORPORATION

By Jeff Walden

sprinkled liberally with stories about Clorox Co., Corning Glass Works, Kimberley-Clark Corp. and other well-known users, this book has the feel of the real world on every page.

Jeff Walden writes like a reporter, freely quoting sources by name. The problems and solutions ring true because someone with a name and corporate affiliation is telling you they are.

This book is offered to "nontechnical managers," yet data processing

and MIS people, particularly those involved with the information center and end-user training, will benefit from reading about the IBM Personal Computer's auspicious entry into the U.S. corporation.

Walden offers some solace to managers who don't have the resources to train end users. "Training is a much bigger issue now than it will be in five years," he writes. "User interfaces will become self-explanatory."

In another section Walden says, "The team that brings personal computers into the organization needs technical grounding, an understanding of the MIS department and an understanding of the needs of the end user."

One can argue with the assumption even if not the sentiment. This quote assumes that DP/MIS isn't the team bringing in the money. Yet the trend seems to be that traditional DP is taking much more of the responsibility now for micros.

Paperback, 203 pages, \$17.95, ISBN 0471-80849-0, by John Wiley & Sons, Inc., One Wiley Drive, Somerset, N.J. 08873.

HANDS-ON GUIDE TO PC AND MS-DOS

By Alan Roenig

This guide, which includes all DOS versions up to 3.1, is clearly aimed at the end user with little experience in the intricacies of operating systems, and little interest in gaining that experience the hard way.

The easy way is an orderly walk through conversational DOS with Roenig as guide. The book teaches new users how to find out what is on any disk, enter new data while printing old, recover data from damaged disks — all practical problems requiring practical solutions.

Paperback, 221 pages, \$15.95, ISBN 0-316-56811-1, by Little, Brown and Co., 34 Beacon St., Boston, Mass. 02106.

THE LOTUS GUIDE TO JAZZ IN BUSINESS

By Lotus Development Corp.

Lotus' own guidebook to the Jazz software program (developed for the Apple Computer, Inc. Macintosh with 512K bytes) is divided into five activities common to most businesses:

- Communications — connecting to Comshare, Inc.'s and other electronic services for access to stock prices, airline schedules and so on.
- Tracking — such as addresses of vendors.

- Analyzing — break-even analysis, financial statements.
- Planning — revenue prediction, scheduling individual work tasks.
- Graphing — from analysis to presentation.

The book is clearly organized, easy to follow, well diagrammed — everything you would expect from the people who wrote the program.

Paperback, 358 pages, \$19.95, ISBN 0-201-16673-9, by Addison-Wesley Publishing Co., Reading, Mass. 01867.

Publishers wishing to have their books considered for review can direct books, prepublication galley, press releases, catalogs or other information to George Harris, Book Review Editor, *Computerworld*, P.O. Box 880, 375 Cochrane Road, Framingham, Mass. 01701.

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CALENDAR

WEEK OF NOVEMBER 3

NOVEMBER 3-7, PHOENIX — Sixth Annual Data Training Conference & Exposition. Contact: Val Adell, Conference Registrar, Wein-garten Publications, Inc., 38 Chauncy St., Boston, Mass. 02111.

NOVEMBER 4-5, NEW YORK — Computer-Aided Design & Facilities Management Conference. Contact: Nancy Furtak, Gralla Conferences, 1515 Broadway, New York, N.Y. 10036.

NOVEMBER 4-6, MONTE CAR-

LO, MONACO — Conference on Advanced Medical Computer Applications. Contact: Dr. J-C Boisselle, Hippocrate 2001, Princess Grace Hospital, Monte Carlo, Principality of Monaco 98000.

NOVEMBER 5-7, PHOENIX — Southwest Semiconductor & Electronics Exposition and Technical Conference. Contact: Joyce Estill, Southwest Semiconductor & Electronics Exposition, c/o Cartridge & Associates, Inc., M259, 1101 South Winchester Blvd., San Jose, Calif. 95128.

NOVEMBER 5-7, PHILADELPHIA — ARTELL '85 — The International Symposium and Exposition on the Industrial Applications of Artificial Intelligence. Contact: Access Conference Associates, P.O. Box 160, Gaithersburg, Md. 20877.

NOVEMBER 6-7, WALTHAM,

MASS. — Information Systems Audit Seminar. Contact: EDP Auditors Association, Inc., New England Chapter, P.O. Box 516, Boston, Mass. 02102.

NOVEMBER 6-8, NEW YORK — Voice Processing: The Applications Revolution. Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

NOVEMBER 6-8, COLUMBUS, OHIO — VM/SP Structure, Flow and Tuning. Contact: Betty Bruce, Education Coordinator, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214. Also being held on Dec. 9-11 in Orlando, Fla.

NOVEMBER 6-8, ATLANTA — CICS Command-Level Programming. Contact: Betty Bruce, Education Coordinator, Goal Systems International, Inc., 5455 N. High St.,

Columbus, Ohio 43214. Also being held Dec. 2-4 in Dallas.

WEEK OF NOVEMBER 10

NOVEMBER 11, MONTREAL — VSAM Foundations. Contact: Betty Bruce, Education Coordinator, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

NOVEMBER 11-12, COLUMBUS, OHIO — Introduction to VSE/SP 2.1 for Systems Programmers. Contact: Betty Bruce, Education Coordinator, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

NOVEMBER 11-13, MILWAUKEE — CICS Internals for Systems Programmers. Contact: Betty Bruce, Education Coordinator, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

NOVEMBER 11-13, CINCINNATI — Mainframe Networks. Contact: Gloria Styfield, Federation of NCR Users Groups, Mail Station SDC-2, Dayton, Ohio 45479.

NOVEMBER 12-13, MONTREAL — VSAM OS/DOS Performance & Tuning. Contact: Betty Bruce, Education Coordinator, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

WEEK OF NOVEMBER 17

NOVEMBER 18-19, BOSTON — Software Tools Conference. Contact: Suffolk University, Boston, Mass. 02108.

NOVEMBER 18-19, SAN FRANCISCO — Real Estate Investment Opportunities for Financial Institutions. Contact: Alice Gibbons, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

NOVEMBER 18-19, TORONTO — End-User Computing: Managing Information Centers. Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

NOVEMBER 18-22, ARLING-

Continued on page 52



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**The time has come
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"The only reason to buy a database management system is to build better applications."

Throughout the history of the software industry, proponents of one database architecture after another have promoted their respective systems as the sole solution to a company's application backlog problem.

The early debate centered on hierarchical versus network architecture. Advocates of inverted file entered the argument in the 70's. And today, relational is the architecture of choice.

While this discussion about architecture is interesting, it's just not the issue.

Database management systems, beginning with the very first, were created to do one thing and one thing only—they were created to build better applications. *Building applications—efficient, online applications, faster, with fewer people—is the only real issue.*

Today corporations have a huge backlog to contend with. And the applications they need to develop have different characteristics. Some may be retrieval only. Some may be heavy on update. Some will run the company, and will require professional development. Some can be created by end users to satisfy their own needs.

It is extremely important to have a database



management system that can handle all applications. *It is essential* that a database include tools rich and comprehensive enough to accommodate both the professional developer and the end user. It's the richness and power of these tools that's critical to the successful implementation of highly responsive fourth generation applications. What's demanded, in fact, is software that goes a *step beyond* today's conventional relational database systems.

With a comprehensive database management system and the appropriate tools like the kind I'm talking about, you'll make the data processing department a *strategic asset* instead of corporate overhead. You will make your company succeed in a highly competitive world.

In Cullinet's new Annual Report, Presidents and CEO's of major corporations speak about the positive impact Cullinet has had on their operations. For a copy that you might like to read and pass along to your company president, write to me. I'll see that you get one.

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The only database management system worth buying is one that meets these six requirements.

Stated simply, IDMS/R is a step beyond today's conventional relational DBMS because it meets these key requirements for building successful applications.

1. MIS Application Development Facilities

The application development system required to build high performance production applications requires more than a fourth generation language. Cullinet's ADS/OnLine is a comprehensive application development environment for the MIS professional combining fourth generation language with a menu-driven modular development approach. Integrated with the data dictionary, this minimizes not just the programming but the entire design, development and documentation of an application. Furthermore, this approach produces a dramatic reduction in maintenance and support.

2. End-User Application Development Facilities

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3. Relational Architecture

IDMS/R allows for the definition of databases using the relational data model. Data tables and associated user views are easily defined online. Additionally, any number of key fields may be defined. IDMS/R also supports advanced relational features including referential integrity and domain

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4. High Performance Database and Application Tuning Facilities

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5. Dictionary Driven DBMS

Data integrity and data independence are essential in a DBMS environment. The dictionary actively controls the source and use of all data. Data definitions, data validation criteria, data formats and security are all defined within the dictionary and exist only once, eliminating redundancy and ensuring integrity. This information is then automatically used throughout the system. Examples of the functionality of this facility include never needing to define output formats for query; never needing to define field attributes for screens; never needing to code validation and editing criteria when using ADS/OnLine. Only IDMS/R provides this level of dictionary integration.

6. Open System Architecture

With the unique Open System Architecture of IDMS/R you can maximize your investment in existing software. IDMS/R accepts data from outside the database environment with direct access to VSAM files. In addition, applications written to access other databases like IMS, DL/I, TOTAL, or VSAM can directly access IDMS/R without modification. IDMS/R is designed to work in virtually all IBM mainframe operating systems and teleprocessing monitor environments.

IDMS/R: More than a relational DBMS

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NEWS

From page 48

Calendar

TON, VA. — Tutorial Week Washington '85. Contact: Maria A. Camilleri, Institute of Electrical and Electronics Engineers, Inc. Computer Society, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

NOVEMBER 18-22, HOUSTON — Structured Systems Design Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77062.

NOVEMBER 18-22, SAN FRANCISCO — Database Management Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77062.

NOVEMBER 20, BOSTON — T-1 Carrier Strategies. Contact: DMW

Group, Inc., Seminar Division, 2020 Hogback Road, Ann Arbor, Mich. 48104.

NOVEMBER 20-21, ROSEMONT, ILL. — Network Management/Technical Control. Contact: Louise Myerow, CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

NOVEMBER 20-24, LAS VEGAS — Computer/Fall '85. Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02164.

NOVEMBER 21-22, SAN FRANCISCO — Import/Export Financing for the Small to Mid-Sized Bank. Contact: Alice Gibbons, Inter-Financial Association, 21 Tonal Vista Blvd., Corte Madera, Calif. 94925.

NOVEMBER 21-22, WASHINGTON, D.C. — PC as a Programmer/Analyst Workstation. Contact: Software Institute of America, Inc., 8

Windsor St., Andover, Mass. 01810.

WEEK OF NOVEMBER 24

NOVEMBER 29 - DECEMBER 1, PACIFIC GROVE, CALIF. — Forth Modification Laboratory Conference. Contact: Forth Interest Group, P.O. Box 8231, San Jose, Calif. 95155.

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DECEMBER 2-3, CHICAGO — Application Prototyping: A Key to Successful Systems Development. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

DECEMBER 2-6, WASHINGTON, D.C. — Defense Computers and Graphics. Contact: World Computer

Graphics Association, Inc., Suite 399, 2033 M St. N.W., Washington, D.C. 20036.

DECEMBER 3-5, NEW YORK — Telemarketing/East. Contact: Telemarketing East/West, Inc., P.O. Box 829, Arnold, Md. 21012.

DECEMBER 4-5, PALO ALTO, CALIF. — California Computer Series. Contact: Norm DeNardi Enterprises, Suite 204, 299 S. San Antonio Road, Los Altos, Calif. 94022.

DECEMBER 4-5, PHOENIX — Arizona Electronics Expo. Contact: Morgan-Granplan Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

DECEMBER 5, DALLAS — CDA's Regional Reception. Contact: Dianne L. Sims, Computer Dealers and Lessors Association, Inc., 1212 Potomac St. N.W., Georgetown, Washington, D.C. 20007.



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IN DEPTH



The information center adapts to corporate America

By Beatrice Garcia

The use of information centers is on the rise. Users include business analysts, clerical staff and DP professionals — all trying to get the most out of their computers.

The information center concept was born in 1976, a brainchild of IBM Canada that was intended to alleviate the critical data processing backlog and to help market IBM's own products. Since then, the information center has grown up, left home and developed an identity of its own.

It didn't take long. Corporate America looked at the concept, quickly recognized a good thing, smoothed it, customized it and adopted it for its own.

The dramatic increase in the number of information centers has been fueled by the compelling benefits of end-user computing. Indeed, according to a recent Computer Intelligence Corp. survey, Fortune 500 companies now average 3.2 information centers each. The information center surfaced as an indispensable tool for helping computer users get the most out of their computer resources. Some DP departments, which at first eyed centers with suspicion, at last welcome them as a separate and valuable helping hand, not a threatening one.

No matter how they are organized, the primary

goal of information centers is always the same: to provide end users with the software tools, training and support they need to utilize the power of computers themselves.

Much of the hardware focus has changed during the information center's development stages. Many center staffs now spend as much time training users on micro software as they do on mainframe systems.

And although all information centers share some things in common, each center is unique because each company is unique — each must forge its own set of operating procedures to serve its end users best.

The center's evolution

A recent survey by Crwth Computer Coursewares looked at pilot vs. mature information centers. Crwth defined pilot information centers as those in existence for less than one year and mature centers as those in existence for three years or more.

Of the more than 1,000 companies that responded to Crwth's inquiries, half were Fortune 500 companies, 25% were Fortune 1,000 companies and the other 25% were large organizations not commonly classified by the Fortune labels, such as aerospace firms and government agencies.

Attesting to the recent growth in the numbers of information centers, only 14% of the centers Crwth surveyed in 1985 existed in 1980. By

Beatrice Garcia is director of marketing for Crwth Computer Coursewares. Garcia edited the Crwth Information Center Survey, which may be obtained from her through Crwth in Los Angeles.

IN DEPTH/INFORMATION CENTERS

1981, the number of information centers had doubled. In 1984, 15% of the respondents set up new centers, and an equal number planned to start in 1985.

Centers growing up

The American Management Association 1985 study on information centers reports that 80% of its billion-dollar member companies have set up information centers. Again, the movement is recent: One-third of those started up in 1984, and as many more planned to form in 1985.

A Diebold Group, Inc. survey of 180 large corporations found that 80% had information centers in 1984, an increase of 67% from just a year earlier. Computer Intelligence Corp. estimates that by the end of this year, there will be a total of 6,000 information centers nationwide, confirming that the information center is now a fixture in corporate operations.

The Crwth survey found that the majority (54%) of the pilot information centers responding to its survey supported 24 or fewer end users. But by the third year, a large percentage of centers (70%) were supporting more than 800 end users.

Training is a major part of the information center's responsibilities to its clients. Typically, when the information center is brand new, the manager plus a staff of one try to train everyone in classrooms, small department groups or one-on-one. As the number of a center's clients increases and their needs multiply, the center's staff try other training methods to multiply their effectiveness.

Computer-based training

Computer-based training (CBT) is one inexpensive, effective method. Used alone or in combination with other methods, CBT can be a powerful training tool. It is portable and therefore can go where the students are. CBT doesn't require an instructor but can efficiently and unobtrusively augment classroom training when necessary. Furthermore, CBT is interactive, giving students immediate feedback and individual attention.

Most center managers use a variety of training methods, alone or in combination. Larry Page, manager of training and development for the data systems division of General Dynamics Corp. in St. Louis, and his staff train 4,000 people per year. Spending about 40 hours per person trained, using classes, CBT, multimedia and interactive videodisks, he says, "We use all the tricks in the bag."

Page stresses that instructors are still necessary for at least part of most training sessions. "We find that no matter what we use, there is an increasing need for the facilitator person in the loop to assure effective skills transfer. The part of the class facilitators can provide is the piece that takes the off-the-shelf package and makes it specific to a General Dynamics environment."

Trainers must recognize the difference between training end users and DP professionals and adjust to the students' level. Programmers are easy to train. They see themselves as programmers and get wrapped up in the language. They are also willing to make the long-term intellectual investment before they use the tool because their profession and the tool

are almost synonymous.

An end user, on the other hand, only wants to learn enough to satisfy an immediate need. This user may not be willing to invest the time to learn the entire tool before starting to use it. Even expert end users see themselves not as computer experts but as financial analysts or accountants who use Lotus Development Corp.'s 1-2-3, for example, as only one of their tools. Therefore, they may be unwilling to invest the time to learn the entire package thoroughly.

Staffing

The question of how to staff must be carefully considered from the very beginning. "The staff is the key to success in the information center," says Pauline Sheng, manager of Strategic Office Services at Syntex

(U.S.A.), Inc. in Palo Alto, Calif. "If you don't have good people, people that want to help others, people who are knowledgeable and can help others, no one will call you. Or they'll call you once but not twice."

Sheng's staff members come from various backgrounds. She employs programmers, end users and former word processors. "They have some things in common: They are understanding, they are caring and patient, and they don't sound like they know it all."

Since starting work at the information center, Sheng says, all of her people have become very technical. "I think that's very appropriate because as the information center matures and the end users become more sophisticated, the level of technical expertise should mature also."

General Dynamics' information

center staff is also a "real mixture," Page says. "The interpersonal skills of the staff are more important than their technical skills — though not by much. They have to be technically qualified to maintain their credibility in the minds of the users."

Technical vs. interpersonal

Almost all the Crwth survey respondents considered communications skills an extremely important attribute for center staff members. Of the respondents, 87% believed that an extensive communications aptitude is necessary, and an additional 11% felt that at least some communications skills are necessary.

While virtually all the survey respondents felt that the information center staff should be familiar with DP tools, they differed as to the importance of technical prowess:

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It is the "previously unthinkable" projects that are now possible — those that could never even have been considered — that are the major benefits of the information center's successful operations.

46% said that extensive DP skills are needed, and 54% said only some DP knowledge is needed. At least some managerial experience, sales skills and business background were also judged important by the majority of survey respondents.

A staff with a variety of backgrounds and skills can also more easily relate to the diverse clientele that information centers serve. The centers surveyed by Crwth reported that their clientele is made up of 33% business analysts, 27% clerical and administrative staff, 24% "others" (which included DP professionals) and 16% supervisory personnel.

This means that there is multiplicity of backgrounds, aptitudes and needs among end users, a factor that the information center's staff must take into account.

Not surprisingly, fewer pilot in-

formation centers have full-time managers than mature centers do. Centers that are three years old show an increase in full-time positions, with 66% reporting full-time managers and 80% reporting a full-time systems analyst.

Also, as the information center matures, the number on the staff increases dramatically. One to three staff members is common for pilot

centers; four to 10 members is common for mature centers.

User benefits

The Crwth survey showed that information center benefits to end users and to the company as a whole continue to increase dramatically over time. Some of the benefits listed by survey respondents may surprise managers considering starting up an

information center.

Of significant interest to DP professionals is the news that information centers can promote an appreciation by end users of DP's role in the company and its contribution to their jobs. This primary benefit shows up early. Sixty-five percent of the pilot centers plus 70% of the older centers had already seen the benefit of improved end-user/DP relations.

Obviously, one primary goal of the information center is to develop computer literacy among end users. While only half of the pilot centers felt they had experienced this benefit, 80% of the centers that had been operating for more than three years had achieved this objective.

These more literate end users can then apply this new technology to increase job productivity. Routine and time-consuming clerical tasks can be automated with computer-generated reports, graphs, charts and spreadsheets. While only half of the pilot center personnel felt they had already reached this aim, 86% of the mature centers reported increased job productivity.

When end users can process routine information efficiently to increase productivity, the next step is for them to utilize this information for decision making. For example, business analysts who can access corporate information and then summarize it, analyze it and do "what-if" analysis with it can react faster and better to changes in the marketplace and thus sharpen their corporation's competitive edge.

Of the Crwth respondents, just half of the pilot information centers reported enjoying this benefit, but a solid 86% of the older centers reported that they had attained that goal.

Ed Kateron, information center manager at Manufacturers Bank in Detroit, reports that his company has experienced all of these benefits. Job productivity, for example, has risen significantly among lower staff levels now that manual functions are being computerized. As a result, the work is done faster and more efficiently.

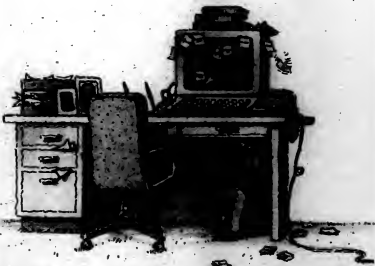
"On the higher management level, however," he says, "the benefit of the information center is even more significant. Managers are doing things that they couldn't before — or had never even thought of." Processing certificates of deposits (CD) is a perfect example, he says.

"We always seek ways to improve investment. To do this, the bank has to examine the profile of account holders. This was previously done with microfilm and a full profile took several days to complete."

"Now the CD people use the computer to get information that is essential to service that critical account base," he notes. "I would estimate that this department alone has saved over \$100,000 in just two weeks."

"However, the real benefit is immeasurable," Kateron explains. "The ability to access and analyze data gives us the chance to react faster to the marketplace and make better decisions. This translates into a sharpening of the overall competitive edge of the bank."

The least reported of the benefits was the reduction of the DP backlog. Only a small percentage of both categories of respondents felt that their information centers had affected this problem positively. Only 16% of



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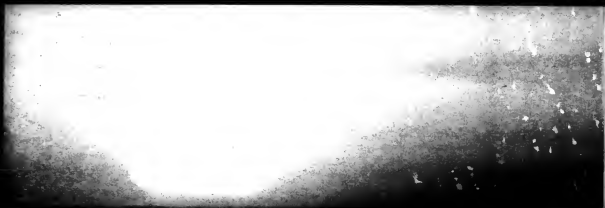
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pilot centers and 33% of mature centers felt this was a benefit their users reaped.

These figures do not include the so-called "invisible backlog" — those jobs that would have been valuable but that were never submitted to the DP department because of the delay, sometimes lasting years, that employees had grown to expect.


Marilyn Richardson, a consultant and partner in the Richardson and McMahon Information Center consulting firm in Denver, concludes that the major benefit of the information center is not the reduction of this invisible backlog, which is generally recognized. Rather, it is the "previously unthinkable" projects that are now possible — those that

that are now possible — those that could never even have been considered — that are the major benefits of the information center's successful operations.

These responses indicate one overwhelming conclusion: As soon as the information center overcomes the initial hurdle of helping new users become comfortable with their machines and software, the benefits quickly multiply.

Obstacles to success

While the benefits of end-user computing are compelling, its realization is often jeopardized by several obstacles. Like the benefits, the obstacles change as the information center matures.



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IN DEPTH/INFORMATION CENTERS

Crowth's survey found the following obstacles:

- Lack of end-user awareness.
- Shortage of DP trainers.
- DP resistance.
- Management resistance.
- CPU shortage.
- Inefficient disk space.
- Lack of a chargeback system.

During the pilot stage information center management perceives the lack of end-user awareness to be the major implementation problem. The pilot information center targets a small, motivated user group. However, once it goes public with a larger target audience, its success is dependent upon a much wider base of end-user interest. Having invested more heavily in staff and equipment to expand, the center must be able to show that it serves a larger number of end users in order to justify the expansion. Information centers therefore turn to aggressive marketing programs to inform end users of training and support availability.

For mature information centers, the foremost obstacle is a lack of DP trainers. Only 50% of the centers responding employed a full-time trainer. During the pilot stage, the low teacher-to-student ratio tends to obscure this problem, but slightly over half (51%) of the more mature centers said it was a problem.

Paul McGee, information center manager at Union Pacific Systems in St. Louis, notes that part of the center staff's duty is simply to be available. "All these things we want to do are very difficult to do because we're so caught up in the demanding day-to-day business of answering the telephone and helping people who walk in."

Three-year itch

Resistance from top management was even more of a problem for mature information centers than pilot ones, a significant obstacle that needs further analysis. If the people who control the budgets and resource allocations cannot be con-

vinced that the center is a worthwhile project, it cannot succeed. An alarming section (almost 40%) of the mature centers report that management resistance remained a problem.

Consultant Richardson says that she is not surprised. "When an information center is first set up, management is willing to see how things go," she explains. "But once a center is around three years old, management may begin to feel that it is not satisfying corporate goals." Often the center manager didn't take the time to find out top management's perceptions or expectations.

"

*Once a center is around
three years old,
management may begin
to feel that it is not
satisfying corporate goals.*

"In order to get top management support," she continues, "the center staff has to think beyond just the number of end users trained. It has to illustrate to top management how it has sharpened the competitive edge and helped people make faster, better decisions."

Most information center managers report an ongoing problem of justifying not only budget increases but also the center's continued operation. Sheng reports: "Just because we got started with a lot of management support doesn't mean that we're not constantly having to justify our existence. It's a process that goes on every year, and every year it gets tougher."

Unlike many other company operations, the center's gains are not easily reduced to hard numbers. "We're having a real tough time quantifying the benefits," McGee admits. "That's something we're going to have to look at a lot more

closely if we ever want to experience the kind of growth that we feel is justified."

Numbers resulting from a chargeback system sometimes help justify the information center's services. Some center managers see such a system as absolutely crucial to establishing credibility in the company and independence as a unit. By forcing end users to account for the costs of computer time, a chargeback system gives end users responsibility for the cost-effectiveness of end-user computing.

General Dynamics' center uses chargeback to assess a \$15 per participant hour fee for training. "We're proud of accounting for training as a product line," Information Center Manager Page says. "We recover all our costs for operating the training function."

In that center, training resources flow according to what participants are, in effect, spending. "The chargeback system tells us something else," Page notes. "If there isn't a business case out there for it, we shouldn't be doing it."

Half of Crowth's correspondents are planning to implement a chargeback system soon. The most popular chargeback systems are based on CPU time (32%) and disk space (24%). Other chargeback systems are calculated according to connect time (16%), hourly rates (12%) and a flat rate (8%).

The key for information center managers is to keep the users' changing needs constantly in mind. Every center must take a marketing approach, addressing the end-users' needs as they come in, or lose its reason to continue.

Whether the company is large or small or the information center is "pilot" or "mature," the main reason IBM gave birth to the information center concept is still valid: End users need help to utilize the power of computers fully. The needs are so great that few centers ever stop growing. The benefits are so significant that they collectively add up to sharpening the competitive edge of the company.

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Hobbling Productivity

By Lois Zells

Why train employees if you don't give them the means to use their training and become more productive? Training dollars could be better spent if managers shed the handicaps of conflicting goals and middle management block.

Efforts to improve organizational output often fail unexpectedly. Managers are thrown for a loop because they concentrated on such items as new procedures, methods and equipment and expected to see real results — results that can only be realized if strategists focus instead on the people who have control over these items.

Meaningful increases in productivity depend on the organization's greatest asset — the employees and manager who work on the equipment. Effective training programs are linked with better performance and enhanced productivity. Specialists in operations management agree that vocational grooming of the staff is clearly one of the highest leverage functions in which an organization can invest.

Yet a good understanding and appreciation of employee training is still hard to find among DP professionals. It is difficult to grasp why, when there is such an overwhelming national concern about increasing output, companies fail to use the training process to achieve their objectives.

For example, surveys of managers often reveal that training in general is not considered important in their organizations. At the same time, however, these managers state they are unhappy because their employees cannot determine how new technologies and management concepts should be used to increase

productivity within the organization.

In perspective the dilemma is obvious: How can the employees be expected to improve their skills when they were unable to ascertain what was expected of them? How can they improve when they are not given the opportunity to learn the skills to satisfy corporate requirements and when they are not given the learning periods necessary to refine their expertise.

Still, many organizational managers will staunchly defend their training functions and take offense when their programs are classified in the educational Dark Ages. These managers will point out the number of classes whose training objectives they believe were clearly satisfied. They will produce the rating statistics that "prove" that the classes were successful.

Managers will declare that the seminars their employees attend are meant to improve the skills of the students. They are not just a cover for vacations, a break in the monotony of routine or a way to substantiate that overall training requirements are being met. These managers will insist that training programs increase both individual skills and company productivity.

Similarly, most attendees at training seminars regard the opportunity as a genuine employment perk, not just a break. They recognize that continued education is one road to career advancement. Seminar students are usually eager and optimistic, and this attitude is frequently complemented by the enthusiasm of the instructor.

The effect of company culture

But then something goes awry. Disillusionment sets in — either during the learning session or on the job. Employees convey feelings of extreme frustration and exasperation: "Why are we learning these concepts when it is not likely that we will really implement them in our organization?" "Since we can't make any decisions about implementing these procedures, why aren't our managers here to hear that?" "Why is there never enough time to do it right, but there is always time to do it over?"

Proud of their awareness of state-of-the-art technologies, the directorate of Gutzle 'Em Up Vacuum Cleaner Co. developed an aggressive plan to teach its technical staff. As part of the program, a five-day seminar was presented to 25 prospective project managers, costing Gutzle 'Em Up over \$100,000 in presentation expenses and attendees' salaries.

The students loved the class and gave it the highest ratings possible. However, at the same

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time they were unwilling to believe they would get the organizational support to implement the management concepts they had just learned. Further investigation showed that other employees who had been taught the analysis and design techniques were not being given the time on their projects to apply properly the skills they had learned. Surprised at these findings, the consulting company who presented the seminars arranged to interview several levels of management. The interviews revealed surprising attitudes:

■ One manager believed that no one actually expected anyone to use the skills being taught — that the company was only interested in exposing its employees to what was going on in the outside world.

■ Another first-line manager was very frustrated because there was

always an inordinate push for quick and dirty solutions, with no regard for quality or future maintenance costs — in spite of protestations to the contrary from upper management.

■ A high-ranking director was interested in maintaining the status quo and not introducing any controversial issues that would rock the boat.

■ Executive management believed everything was under control and indicated it didn't want to hear otherwise.

To what end are we spending such large sums to educate our employees — especially when follow-up evaluations of training programs frequently show limited use and application of the techniques that were learned during the sessions? Why aren't we seeing tremendous improvements in

employee output?

Conflicts

The shocking truth is that the training process as we know it now is simply not working in many organizations. As a matter of fact, many companies are unaware that they are not realizing the benefits they should expect from their training programs.

In most cases, failure to implement new approaches is not the fault of the training programs at all. Surprisingly, lack of success often occurs because the corporate value system is simply in direct conflict with the group's ability to achieve its goals. Companies that recognize the impact of these opposing forces also realize that marked improvements will be less dependent on mechanical procedures than on innovative

changes in the personality of the organization.

Corporate personality — so-called "organizational culture" — is the result of subtly or directly programming people's behavior in given sets of circumstances. Long-term increases in productivity will necessitate the infusion of strong, positive cultures into organizational objectives.

But why are many organizations unable to capitalize on this concept and create an environment that does nurture higher yields in personnel investments? The cause is primarily due to serious flaws in their existing culture, such as inflated and unreasonable expectations, conflicting organizational objectives and priorities, insufficient executive management sponsorship and sparse middle management participation.

Given each of these environmental inhibitors, it's a wonder we see gains of any kind. Before any turnaround can be affected, these contributors to failure must be understood.

Great expectations

The most successful programs are not always the ones with the biggest budgets or the highest visibility but instead are those that truly live up to their predictions. Deviations from what the organization perceives the program will deliver can therefore be the single most important cause of failure. It follows, then, that the highest productivity gains are achieved in endeavors where there have been a minimum number of surprises along the way.

Aspirations for training programs are not different. Expectations may be unrealistic and unreasonable, and they will rarely be in total agreement. Yet, traditionally we muddle through the process, hoping that everyone has identical perspectives and that no conflicting opinions exist.

If we encounter sensitive issues, we close our eyes, trudge on and pray that time and short-term successes will make them go away. To the contrary, it is necessary to meet these controversial subjects head-on, assess the impact to both the company and the programs, crystallize the differing views, resolve the conflicts and disseminate this information to the participants — before the program even starts.

Typically, a company's widespread commitment to its programs is not thorough, clearly defined or even understood. In general, this results simply from a lack of understanding of the organization by its managers. As a result, there is inadequate priority setting, as business needs shift like eddies of a stream.

First, the resolution of conflicting managerial and technical goals and objectives is not usually addressed or completed. Imagine, for example, a project that must be finished within six months, must deliver a particular technical solution and must incorporate a selected state-of-the-art product or process that has not been perfected and for which the company has few or no resources with the technical expertise. This program has irreconcilable conflicts that doom it to failure before it even starts.

Next, resource conflicts often dictate that the most competent participants are not appointed but are instead assigned to some other project

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In most cases, failure to implement new approaches is not the fault of the training programs. . . . Lack of success often occurs because the corporate value system conflicts with the group's ability to achieve its goals.

or activity. Because of this limited resource availability, those actually assigned to the new project are often the most expendable individuals and frequently are not even wholly qualified. Yet there are often no plans to train these individuals formally or allow sufficient time for them to go through the required learning period.

Skyhigh Explosives Co. has more than 6,000 employees in three regional areas. Its distribution system is maintained in the largest region, East Strawberry, Ariz., but there is also some decentralized data processing in the two other regions.

In an effort to reduce systems maintenance by accumulating data on downtime and its causes, Skyhigh purchased Miracle Worker, a main-frame software package for maintaining historical information about problem determination and resolution. After the package's implementation, users from each of the three regions were to be required to enter data into the system.

The company's Garibaldi, Ore., operations staff was chartered to implement the new product and, accordingly, received intensive training in the use and features of the software. Unfortunately, several of the staff were new to their positions and were therefore only moderately qualified to operate the new system. Because they did not possess the necessary technical prerequisites, they were often unable to keep up with the learning experience.

Furthermore, the importance of the project and its relationship to other projects and existing business was not communicated to the Garibaldi users and programming staff, and neither of the other two regions was even informed of the existence of the project.

Not surprisingly, the other Garibaldi personnel were all up to their ears in their own high-priority enterprises. Similarly, each of the other regions was also busy trying to implement high-priority projects and was having difficulty getting support for its efforts.

Over \$700,000 was spent before Miracle Worker was shelved. Both the project team and the vendor were dubbed as failures. There were no figures gathered on the other project results.

The conclusion we are forced to recognize is that many organizations simply spread themselves too thin in their project implementation and subsequent training efforts. The pity is that this is not a conscious business decision on their parts. It is rather a default process that results from lack of proper planning and prioritizing of organizational objectives.

Executive change agent

While the need for changes in culture may be identified at all levels of the organization, recognition frequently bubbles from the bottom up. Nevertheless, real change can be successfully implemented only with strong top-down support.

Upper management — as important components of the organization's culture — can be key in the success or failure to implement any new concept or philosophy. Because upper management's attitude determines cultural acceptance of the new program, success is directly proportional to the level of managerial participation and influence.

If senior managers lack a clear understanding of what it takes to implement the program, they may inadvertently fail to support success-oriented strategies. By the same token, strategies may be agreed upon, but when the teams attempt their implementation, organizational support may not be evident. Similarly, decisions that affect program success may be made without program

representation, placing the entire effort in an untenable position and weakening subsequent implementation efforts within the company.

All management levels must first understand each program and how it fits into organizational priorities and then offer visible and sustained support for each effort. Otherwise, the program is likely to fail. If management is unable to provide this com-

mitment, it may be necessary to re-think organizational objectives. As Barry Boehm says, "If managers do not genuinely want improved productivity, the organization will not get improved productivity."

Additionally, no matter how big the bellyhoo at the beginning, if the management does not demonstrate continued commitment to the effort, the entire endeavor will degrade into an exercise in futility. Therefore, before any educational strategies are developed, training programs planned or practitioners trained, top management must decide the following:

- What their organizational objectives are.
- What finite number of programs they want to implement.
- What kind of organizational culture they want to establish.

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■ What kind of DP environment they want to create.

■ When they want all of these.

■ What they are willing to pay to get them.

■ When they are willing to start.

Then if the culture cannot be modified, the effect of existing company attitudes on the successful implementation of the new approaches must be assessed and made visible.

Ownership of the prob-

lems hampering the project's success needs to be accepted at all responsible levels. Conscious choices must be exercised: how to restructure the environment, restructure the programs or restructure organizational expectations.

Management block

Improvements to operating results and the corresponding increases in the bottom line are often limited only by the opportunities employees have for becoming

involved. This involvement is in turn related to their superiors' willingness to let them participate actively. Thus, while the tone for a winning outcome is set by upper management, successful implementation is also directly influenced by the daily support practitioners get from their immediate supervisors.

A new corporate policy may dictate that an entire group learn modern concepts or skills, and the organiza-

tion may establish elaborate training goals in these areas. Upper management may even subscribe to and actively endorse the implementation of this new approach and the practitioners trained.

However, the situation may arise in which circumstances prevent students from exercising the techniques they've learned, and implementation is again unsuccessful. Situations such as these frequently arise be-

cause of what is termed the "middle management block," a condition in which middle managers become obstacles to the process.

The cause of this block simply may be a natural reluctance to change or it can indicate an innate tendency to guard territorial rights. However, more often than not, the problem occurs because middle managers have not been given the opportunity to learn what is being taught to their employees.

Furthermore, middle managers may have been given little or no chance to understand the long-range goals of the organization. Consequently, these managers may be unable to evaluate whether the ideas being taught to their employees will meet current objectives or support long-range goals. They also may be unaware of how new technologies can be exploited to serve organizational needs.

The middle managers may have little understanding of the foundations of the new approaches and the requirements for implementation. When they have no idea of what is being taught, only halfhearted support may be given to the new methods.

As a result, actual execution of the ideas and practices agreed to by upper management often is distorted or disappears entirely when passing through this barrier.

The bottom-line effect of the middle management block is that often there are no plans for implementing the concepts being taught. When students get back to work, they are not given the chance to apply what they've learned. This turns out to be a shameful waste of company resources.

Since productivity gains are maximized when students return to a working environment that encourages proper application of the concepts just learned, it is essential that middle managers prepare themselves in the subject matter being taught to their employees.

Last, often totally unaware that they are doing so, both upper and middle management may be sending out paradoxical messages that only serve to confuse and frustrate their employees. As an illustration, a manager's written directive to attend a program followed by the same manager's noticeable absence from the program may degrade the introduction into a meaningless exercise, leaving participants frustrated.

Recommendations

Practically speaking, training projects that support the fulfillment of organizational objectives can be implemented with classes that already exist in the marketplace. However, it is

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advisable before embarking on either the selection of these products or any customization work, to first assess the company's program requirements and define its cultural environment.

Assessment

This is best determined through a needs assessment and evaluation, conducted by gathering input from all levels of the organization. After scrupulously defining the required features of the proposed curriculum, a study should be made of marketplace training offerings.

The next step is a careful screening process during which one to three programs are evaluated against the curriculum requirements. One program is then selected.

A representative group of qualified individuals should be chosen to view the proposed curriculum. The purpose of these presentations will be to do the following:

- Consolidate the participants' concepts regarding the basic tenets of the subject matters.

- Familiarize the participants with the current course materials.

- Ensure that the subject matter supports the corporate philosophy.

- Assess the need for modifications either in the curriculum or in the company environment.

Ideally, there should be at least one presentation to each of three key groups, each representing a unique level of the company. For example, the three groups could consist of representatives from the directorate, middle management and practitioners, respectively. The number of attendees at each presentation should be limited to 12 or less.

Alternatively, in smaller programs or organizations, there can be one presentation to an audience composed of representatives from each of the three groups.

Presenting the course at one time to selected groups expedites the subsequent analysis phase by allowing the participants to start with a common framework of understanding.

During every presentation, the attendees usually spontaneously brainstorm about the material being presented. Furthermore, it is not unusual at this time to identify conflicts between the course content and the organizational culture.

As an extended part of the presentation package, a detailed report is prepared, describing the class inter-

view. This summary is written by the instructor after each presentation is concluded. For honesty and objectivity in the responses, it is essential to ensure that at no time will the names of the

contributors be disclosed.

The internal conflicts that have been identified should then be resolved by a group of designated representatives. As described previously, this step may require changes in the organizational culture.

It is also necessary to determine what training modules will be acceptable in the company environment, what should be added or modified and what pieces of the curriculum should be eliminated.

Concepts become rules

Following resolution and

acceptance of either course or cultural modifications, the approved concepts become the rules for doing business in the particular program area. Presentation of the classes becomes not only the instrument for building the skills in the respective subject area but also a medium through which information is disseminated company-wide.

A continuous, voluntary and tailored training program that is flexible enough to meet both the technical and managerial needs of the organization should be developed. A finite and manage-

able number of programs — ones that support organizational objectives — should be selected. It is better to introduce five new programs effectively than 15 poorly.

Each new approach should be introduced with a three-tier training program that includes the following:

- A high-level overview for senior management.

- A more detailed introduction for middle managers.

- An intensive skills-building workshop for practitioners.

While these seminars are certainly an essential part of the process, training classes

by themselves are not enough.

The ideal implementation package should be completed by instituting a follow-up program presented by the same group, a program that teaches the classes and is directed to the teams who are using the new methods. This program should include review workshops and clinics, drop-in consulting and teleconferencing.

Considerations

Before committing to this project, the organization should be aware of six factors critical to success.



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Plan extra time. Because the introduction of radical changes is a nontrivial process, this effort is time-consuming and labor-intensive. We should recognize that new ways of doing business cannot be implemented overnight.

Organizations that choose to restructure their environment should do so only if they acknowledge that change takes time, people and money. There is no free lunch. The only question to be asked is, Do you pay now or later?

Pick objective leaders. The process should be managed by a group that has no vested interest in the outcome — one that will not whitewash the results and report only what they perceive the company wants to hear. This group should have a thorough understanding of the subject matter being examined and should also be qualified in facilitating group dynamics.

Similarly, the fact-finding activities should be conducted in an unbiased manner and in an environment that is nonthreatening, confidential and conducive to honesty. The contributors must feel confident that they can trust the facilitator.

In terms of time and effort as well as for the ultimate achievement of desired results and objectivity, it follows that this fact-finding process may preferably be handled by an outside group.

Protect confidences. In addition to being assured of confidentiality, the interviewees must feel confident that they will be given the opportunity to verify and, if necessary, correct their summaries before they become records; albeit, no names are ever disclosed.

When the information is collated, it may be summarized according to agreements and conflicts. It is extremely important at this point to uncover the red-flag issues present in every organization. Agreements and conflicts should be crystallized, problems should be resolved, and an action plan should be developed. This plan is to be disseminated to the whole organization.

Get executive support. Assuming senior management recognizes that there is a problem, the project should be chartered and directed from an executive status and should involve all levels of the organization. Executives and middle management must carefully weigh and consciously choose to retain or change each idea.

Sometimes a business decision dictates that the company retain a less-than-desirable approach. Though this is certainly legitimate, the organization should do so only when it fully understands the trade-offs and when it has been entirely honest with itself and its employees. Espousing one philosophy and then demonstrating contradictory behavior only serves to confuse employees and weaken subsequent efforts within the organization.

Managers must, therefore, set priorities about the kind of work environment they want to create and then translate these priorities into effective management and technical principles. The outcome of this exercise should be a new or updated business policy for the selected program.

Be patient. The company must be able to regard the implementation of new technologies or management concepts as projects unto themselves, ones that may only be carried

Much as we would like to pretend otherwise, the need for employee education cannot be denied. The costs of poorly trained workers are lost opportunities, low morale, reduced quality, inefficiencies, customer dissatisfaction, tarnished reputations... all of which can blow profits and productivity right out the window.

out over an adequate period of time. As talented as many instructors are, they do not carry magic dust that they can sprinkle on attendees, transforming pupils into instant experts.

As a result, during the learning period, practitioners will make mistakes and have false starts. The environment must be forgiving, and an employee error must be viewed as an opportunity for learning, not punishment. The company must be comfortable with accepting their mistakes and must allow enough time and enough people today to achieve tomorrow's objectives.

State your objectives. Finally, the expectations about drop-in consulting must be clarified. This activity, whereby a subject-matter expert periodically examines the work of team members, is the best strategy for developing in-house expertise.

Workers learn by doing and by making mistakes. However, this technique also has the elements of coming an emotion-matched situation unless the ground rules are carefully spelled out in advance.

Drop-in consulting implies that the consultant bears no responsibility for the results of the work produced by the team between visits. It also means that a lot of catching up needs to be done when the consultant returns and that he or she may not be immediately productive.

When team members have been working steadily on a product for weeks, they then have a vested interest in its outcome as well as a certain amount of pride of authorship. Unless drop-in consultants approve the team's output, the consultants may find themselves in automatic adversarial positions. Although the team thought it was doing a good job, the review may disclose errors, omissions and ambiguities, such as the following:

- How will discarding or radically changing their prized creation affect the workers?

- How does the time required for the rework and the subsequently missed target date affect the organization?

- Will these situations create pressures to do a less-than-quality job?

- When faced with these pressures, will the consultant be able to encourage the company toward proper implementation of the methods?

- If the group chooses to take shortcuts and then the results are unsatisfactory, will they acknowledge that the results are not attributable to the consultant?

Budget matters

In these uncertain and troubled economic times, we may once again be faced with optimizing our budgets. To make matters worse, when asked to reduce expenditures, many

organizations might completely forget the benefits of training and view it as one of the superfluous functions that should get cut when times are tough.

Later, they may be surprised and disgruntled at the inefficiencies, errors, reduced quality and false starts they observe in the work completed by untrained or poorly trained workers. When companies reduce training expenditures, justifying the cutback as a "necessary business decision," it is not so unusual for them to be jolted later on by the unanticipated effects.

By the time they are feeling the impact of limited or nonexistent training programs, these organizations may have forgotten the advantages of strong educational strategies. They may be completely unaware that their problems may be the result of earlier business deci-

sions, perhaps poorly made, regarding training.

Avoiding pitfalls

Managers interested in avoiding these pitfalls should ask themselves the following: Has the organization truly crystallized its objectives and selected a finite number of programs that can be implemented successfully? Does the company really know what it wants from the training experience? Have the training strategies been evaluated against the corporate objectives? Have these objectives been clearly presented to all of the players? Does the training function have the visibility and recognition necessary to support fulfillment of its aims?

Naturally, there are no answers that will work for all companies all of the time. Each organization must choose its own correct philosophy; this information should then be disseminated and continuously reinforced to all the appropriate individuals.

Much as we would like to pretend otherwise, the need for employee education cannot be denied. The costs to the firm of poorly trained workers are lost opportunities, low morale, reduced quality of merchandise, inefficiencies, customer dissatisfaction, tarnished reputations and sometimes even endangered workers or consumers — all of which can blow profits and productivity right out the window.

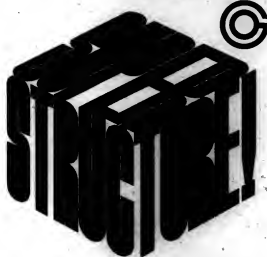
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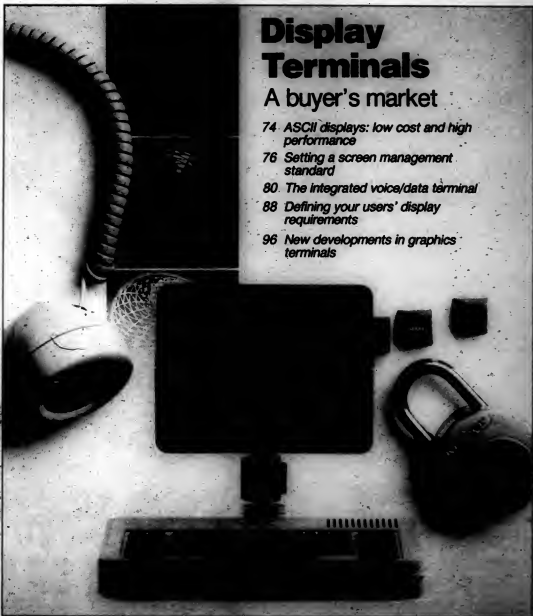
Special Report

Computerworld
October 28, 1985

Display Terminals

A buyer's market

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- 96 New developments in graphics terminals



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IRMA's Fastlink, the new high-speed asynchronous modem for your IBM or compatible PC, can send your data more than eight times faster than ordinary 1200 bps modems.

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SPEED ISN'T ALSO HAS



**ENOUGH. A MODEM
TO BE ACCURATE.**

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Display arena a buyer's market

Advanced technology, increased popularity providing low prices

By Joseph Kelly
Special to CW

Display terminals are still the most popular means of accessing the corporate data base residing on a mainframe or minicomputer. Multiuser minicomputer and microcomputer systems, as alternatives to local-area networks, are gaining popularity and opening up other channels for displays. Currently, there is no doubt that falling prices have made this a buyer's market.

For the past five years, prices at the low end of the display terminal market have fallen at a drastic rate. In 1976, for example, Anaheim, Calif.-based Lear Siegler, Inc.'s ADM 3E (the classic dumb terminal) carried a single-unit purchase price of \$1,096. At that time, this represented the rock-bottom price for displays. As prices fell over the next few years, dumb terminals remained nearly alone at the sub-\$1,000 price range. However, in 1981, Applied Digital Data Systems, Inc., headquartered in Hauppauge, N.Y., unveiled Viewpoint, a terminal with a price tag of \$660.

Viewpoint's price was considerably lower than that of other comparable terminals on the market then. The introduction of Viewpoint triggered a flurry of activity in the display terminal market; prices went down even lower. The low end of the ASCII display terminal market became increasingly price driven.

Eventually, fully featured smart terminals were selling in the \$600 to \$700 range, while units with a lesser degree of functionality hovered around the \$500 mark.

Advances in microprocessor technology made the dumb terminal a thing of the past, so that even the low-end terminals contained smart terminal features. Today, many feel that it is price, not functionality, that matters most in this market.

Whatever the case, it is apparent that distinguishing one vendor's terminal from another is becoming a difficult task.

During the summer, San Jose, Calif.-based Qume Corp., a subsidiary of communications giant ITT, broke the \$400 barrier with the introduction of the QVT-101, a smart terminal with a single-unit price tag of \$396. The move surprised many industry observers who said they felt that prices at the low end of the market had already fallen as far as they could. Increasingly, many vendors had complained that they could make little profit on these low-price units.

Distributors, a primary outlet for terminals, also felt their margins being squeezed by the low price tags. To remain competitive, however, vendors have been forced to match these low prices. So the move by Qume was greeted in the industry with something less than enthusiasm.

Jim Blakeley, product marketing manager for Lear Siegler's Data Products Division, said he feels that the terminal industry already was heading in the direction of sub-\$400 prices at the low end. "Qume might have jumped the gun by six months or so," he said, "but the industry would have gotten to that point sooner or later." Blakeley feels that the major problem with these low-priced terminals will be finding a distribution method, given the slim margin that distributors can earn on these units.

"We'll have to rethink how to get it to market," he said of the ADM 3E. Lear Siegler's enhanced version of the ADM 3. Blakeley added that lower prices were good for the end user but that the inevitable erosion of prices for high-end, fully featured terminals, on which most terminal vendors make their money, may lead to an industry shakeout of some smaller vendors.

Shortly after the unveiling of QVT-101, other vendors responded by breaking the \$400 barrier

themselves. Lear Siegler introduced the ADM 3E with a selling price of \$396. Expert Systems, Inc., located in Melville, N.Y., reduced the price of its low-end model, the ESP 6110, by \$100 to \$395. Wyse Technology, Inc. of San Jose, Calif., the current leader in shipments among the ASCII terminal vendors, introduced the WY-30, priced at \$399. Other vendors, like Televideo Systems, Inc. of San Jose, Liberty Electronics Co. of San Francisco and Applied Digital Data Systems must decide whether or not they want to compete at that price level.

Complicating the situation at the low end of the market are the financial problems currently plaguing many of these vendors, just one part of the slump that has hurt the computer industry as a whole. Layoffs and consolidations have hit many previously successful firms such as Televideo, Lear Siegler, Applied Digital Data Systems, Visual Technology, Inc. of Tewksbury, Mass., and Palco Data Products, Inc. of Sunnyvale, Calif. Many in the industry said they are fearful of a shakeout, given the recent events that have thinned the ranks of the microcomputer industry. The new price level established by Qume may go a long way toward triggering such a shakeout.

Additionally, the vendors in this market may now be seeing the long shadow cast by IBM. IBM's first ASCII terminal, the 3101, was brought to market in 1979. At the time, many of the vendors competing in that market felt that, given IBM's track record in the computer industry, it would soon dominate the ASCII terminal

Sub-\$400 display terminals

Vendor	Qume Corp.	Lear Siegler, Inc.	Wyse Technology, Inc.	Expert Systems, Inc.
Model	QVT-101	ADM 3E	WY-30	ESP 6110
Screen Size	14-in.	14-in.	14-in.	14-in.
Display Capacity	80-col.	80-col.	80-col.	80-col.
Function Keys	4	4	4	—
Price	\$396	\$399	\$399	\$396

Source: Company Represented Data.

The \$400 price barrier for low-end ASCII terminals was broken this summer.

market just as it did the 3270 terminal market. This did not happen, chiefly because the 3101 was a high-priced unit with somewhat limited functionality.

In June, however, IBM made another foray into the ASCII world with the introduction of the 3161 and 3163 display stations. These models combine a higher level of functionality with prices that are more in line with the trend in the industry. The 3161 is priced at \$699.

Continued on page 77

Specialized unit affordable

The drastic change in the low-cost display market is good news to the terminal buyer.

Each year, ASCII display terminals are becoming more and more affordable. Now, even an IBM display may be purchased for less than \$1,000. Drops in component pricing and savings resulting from offshore manufacturing have meant that the quality and range of functionality of the terminals being produced are better than ever, despite the plunging prices. And design improvements have resulted in easier to use and more aesthetically pleasing displays.

Features that were once found only on high-price units or available as expensive options are now standard on virtually every display model being produced. These include the following:

- Tilt/swivel displays.
 - Green or amber screens.
 - Display capacities of 80/132 columns.
 - Advanced editing features.
 - Split screens or windows.
 - Low-profile keyboards with multiple function keys.
- The prospective user is in an excellent position to obtain all of the terminal features desired at a price that only a few years ago was unthinkable.

Kelly, who specializes in the terminal/workstation area, is a senior associate editor for Datapro Research Corp. in Delran, N.J.

Special Report

French videotex network reaches one million homes

By Marie Monique Stocker
Special to CW

France reached a milestone in bringing videotex service to people's homes last month, when the country's telecommunications organization installed the millionth home-based terminal on its national videotex network.

The organization, the Direction Generale des Telecommunications (DGT), offers Minitel terminals—monochrome tubes with basic keyboards—free to residential customers in major regions of France. Customers who want a terminal accept it as a replacement for the printed telephone directory they would otherwise receive.

About 40% of the nation's phone subscribers are currently eligible to receive free terminals. By the end of this year, half of all France's subscribers should be eligible.

Subscribers who choose terminals over phone books have easy access to an electronic directory that includes 23 million white- and yellow-page listings; they pay no monthly fees for this access.

Users log about four million directory requests each month. The network has responded well: in 96% of all inquiries, response time is less than 2 seconds.

The network that supports the di-

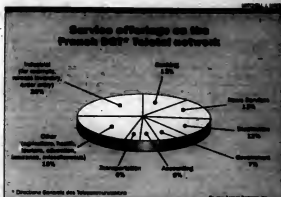
rectory is one of four nets, each with its own access scheme, that the telecommunications organization has set up as components of its nationwide Teletel videotex configuration.

The directory itself is the only network service the group offers directly to consumers. The other three nets support about 1,500 information services that businesses offer to consumers and to each other (see chart).

From their homes, consumers can use the three networks to participate in dating services, make transactions with their banks, submit orders for mail-order goods, arrange for travel and hotel reservations and purchase insurance policies. Residential requests for Teletel services constitute about 70% of total network usage; business users make the remaining 30% of all requests.

Within the next few months, Teletel transactions will begin to take place in conjunction with the use of Bull Group CP-8 smart cards, credit cards that contain embedded microprocessors. Residential users will have their smart cards programmed as passes to electronic checking, as credit/debit cards or as means of direct telepayment for goods and services they order on their Minitels.

To take advantage of these services, users will have to purchase card readers and connect them to their terminals. For access to telepayment and similar offerings, these users will insert their cards into the reading device and key in a predetermined password on their terminal keyboards. The smart card and iden-



Industrial, banking and news services constitute more than half of the 1,500 Teletel offerings.

tification number will validate each other and allow the requested transaction to begin.

The nation's banking community has a \$102.4 million order with Bull for 12.8 million cards and associated equipment. The DGT expects more than three million cards to be in use by the end of 1986.

The organization's policy of offering free terminals for the Teletel network has been both popular and cost-efficient. The DGT is making up for its hard ware investment by saving money it would have spent printing phone books and by taking in new revenue from increased line usage. In areas where Teletel is operational, line usage has increased 20%.

The organization bills subscribers for Teletel line usage in much the same way as it bills for basic telephone calls. Use during peak hours costs about 10 cents for 2 minutes.

The DGT offers discounts of 30%, 50% and 66% for use during specific off-peak hours.

Providers of commercial videotex services bill customers according to a number of cost structures. Their bills can be bundled into a customer's phone bill or charged separately, depending on the provider's arrangement with the DGT.

Residential videotex use has encouraged business growth in related market sectors. Terminal manufacturers, for example, have begun to serve as suppliers to Teletel users.

Three vendors—Matra Informatique, La Radiotechnique and Tele-Alcatel—manufacture monochrome Minitel terminals. La Radiotechnique has also proposed a color model for use with the network; if the DGT approves it, users who want the color terminals will pay about \$20 per month to rent them.

Stocker is president of France Telecom, Inc., the New York-based U.S. representative of the French Direction Generale des Telecommunications.

Buyers getting more for their money

By Rene Goldman
Special to CW

From a vendor's viewpoint, the 1985 CRT-based terminal market is one fraught with falling profit margins and tough competition.

It has become a commodity market. This market includes ASCII, 3270-type, non-IBM mainframe, ANSI-standard Digital Equipment Corp. and IBM System/34, 36 and 38 terminals. Although vendors scramble to reduce their costs and maintain profit margins, buyers continue to get more for their money.

As pricing for terminal technology and components drops, improvements in CRT design and functional capability such as editing, highlighting, protected fields, split-screen functions, color screens and ergonomic architecture continue to rise.

This has resulted in the blurring of the lines of distinction between various types of terminals. In the past, a terminal's price was set in proportion to its capability; dumb terminals carried the lowest price while full-featured, smart editing

terminals carried the highest. Although this is still basically true, advances in technology have caused the divisions between categories to blur.

Today, the various terminal markets can be divided by the protocol and communications interface that the terminal supports.

The terminal marketplace is not, however, homogeneous in nature. This is true even though certain features have become generic to all terminal lines, including editing capabilities, visual attributes and ergonomic housing. The amount of memory, the number of programmable function keys, screen size, monochrome vs. color and so on are mere options.

It appears, however, that options have taken on importance in the terminal marketplace. By bundling features as options, a vendor can maintain, if not increase, its bottom-line prices and gross profits. Stabilizing profit margins has become a top priority in this erratic marketplace.

To maintain profits, today's terminal manufacturers offer a broad range of products and participate in as many market niches as possible. This diversity is possible because of off-shore manufacturing, the availability of inexpensive parts, refine-

ments in the final assembly process and changes in distribution channels.

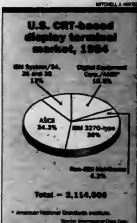
The diversity in product lines is necessary because of the growing number of sophisticated users, the gradual penetration of the personal computer, developments in advanced networking and the maturation of many of the terminal markets.

A historical perspective

In general, during 1984 the CRT-based terminal market experienced more than 28% growth in shipments, with new units totaling 2.1 million. The installed base of terminals reached 8.8 million. The dollar value of shipments for this marketplace grew 21% with a market value totaling \$3.2 billion.

The growth of shipments for 1984's terminal market was stimulated by a variety of economic conditions, particularly in the first half of 1984, as well as an upswing in computer sales. At the same time, however, sales were strong for the marketplace and an undercurrent of fierce price wars were beginning to stir.

Over the past several years, major realignments in production costs, component pricing and improvements in quality testing have



The CRT-based display market in the U.S. is broken into five categories.

changed the market's cost structure. Vendors expected that price cutting would stimulate sales. Unfortunately, the marketplace is not enlarging because of falling prices. Although 1984's terminal market grew more than 28%, International Data Corp. (IDC) estimates that by 1990, growth will fall off to the 10% mark.

Continued on page 94

Goldman is a research analyst for International Data Corp., a market research firm based in Framingham, Mass.

Group proposes screen management system standard

By Daniel R. Prantz
and Peter Povey
Special to CW

Our industry spends a lot of money building good human-computer interfaces for terminals and then wastes a great deal of that money reprogramming these interfaces for new types of terminals.

An international group of interactive software specialists, the Screen Management Task Group (SMTG), recently took the first step toward a standard for forms-oriented use of terminals.

The standard should ease initial programming efforts and reduce reprogramming for new terminals. This work covers the full range of terminal devices, from simple character-cell devices to bit-map graphics workstations, including read-only devices, such as badge readers, and write-only devices, such as printers.

The problem

A vast variety of terminals is now available. Along with the proliferation in sizes and types of terminals, manufacturers and software houses have produced a number of different methods for controlling them. Often the only way a program can control the interaction with the operator is to access the hardware features directly, as in many personal computers.

Increasingly, however, vendors have provided more convenient ways to control the interaction between operator and program. These range from new or modified statements in various programming languages to screen-handling software packages that ease the creation of forms and separate the details of the terminal from the program. Examples of statements in programming languages are extensions to AC-CODE/DISPLAY in many Cobol dialects and POSITION in some Basic dialects.

A typical feature of screen-handling packages is a screen painter or form editor, an interactive program that uses the philosophy that "what you see is what you get." A designer sits in front of the VDT and interactively creates what the operator will see.

The screen painter/editor then stores the work of the screen designer according to the particular implementation — either as a separate entity or as a piece of a program to be embedded in a host programming language.

System software designers face a major problem in the lack of standards for screen handling. One vendor's package is usually quite different from another's, unlike the situation with file access in which, for example, the same concepts of indexed sequential files are built into the definitions of many languages and operating systems.

The variety of terminals only serves to compound this difficulty. A

vendor's package often handles only terminals from that vendor or terminals in a restricted class. With new technology creating new terminals with new features at an increasing rate, programmers continually have to change their programs.

The new bit-map terminals and windowing features offer opportunities that many departments would like to use in improving the human-computer interface, but the need for extensive reprogramming is slowing the migration to such terminals.

Such reprogramming is expensive and time consuming, but it is a problem with which one can deal. A complete solution to the problem re-

quires work by more than just a single application shop to be truly effective.

Why a standard?

A screen management standard would have many benefits. Most obviously, applications that use the standard would be more portable across different vendors' equipment. Software houses adapting their packages and individual installations moving to another machine would have less of a software conversion barrier.

Programmers learning a standard method of handling screens would realize an advantage similar to that

of learning the standard method of handling files. They wouldn't have to retrain in every new environment; they could concentrate on the unique demands of the data processing task rather than on the quirks of the vendor's software. Training costs would go down, and productivity would go up.

Finally, in complex systems, there are advantages to a standard related to complexity itself. Since the proposed standard is not tied to any one language, designers could choose any language for their DP and computational needs, even a mixture of languages, knowing that their screen management needs can be satisfied

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Prantz is a consultant software engineer and Povey is a principal software engineer for Digital Equipment Corp. Both served on the Screen Management Task Group to develop the proposal for the Screen Management System standard.

Special Report

independently of that language.

In addition, the standard is designed explicitly to make distribution in a network both possible and efficient; multivendor configurations then become easier to handle.

What's been done?

SMTG has been studying screen management problems for the past five years. This group has produced a proposal for a standard for screen management that is now ready to be considered by the rest of the industry. The proposal is known as the Screen Management System.

The wider aspects of terminal management also are being debated by the International Standards Organization (ISO) in its work on the Open Systems Interconnect (OSI) model. OSI is considering windowing

services and will discuss the Screen Management System as a possible application layer service.

The ANSI X3H3 committee on graphics is also considering windowing standards. The Screen Management System contains features that allow it to be used in a windowing environment and to coexist with the OSI and graphics work.

Proposal status

The SMTG was originally chartered by the CODASYL Cobol committee to develop a screen management facility for Cobol. In spite of this initial concentration, note that the SMTG, the companies that served on the SMTG and the Cobol committee itself all had the goal of language independence for the Screen Management System — it was to have no

special ties to any language but was to serve all languages.

From 1979 to 1984, representatives from more than 16 organizations attended SMTG meetings. Although the Screen Management System is not complete at this time, it has been accepted by the Cobol committee as the basis for a further standardization effort. CODASYL and ANSI are now discussing what should constitute the proper makeup and home for such a committee.

Copies of the Screen Management System proposal are available as a CODASYL publication titled "Proposed CODASYL Screen Management Committee Journal of Development," from Canadian Government Publishing Center, National Printing Bureau, 46 Sacre Coeur Blvd., Hull, Que. K1A 0B7.

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From page 74

Display arena a buyer's market

significantly lower than the \$1,660 price tag of the 3101 Model 22, which it replaced. The 3161 offers emulation of several popular display models from Applied Digital Data Systems, Lear Siegler, Kiprit Systems and Televideo; this marks the first time that an IBM terminal is provided with emulation of independent vendors' units. The 3163, which is priced at \$1,095, placed IBM for the first time in the Digital Equipment Corp. VT100-compatible terminal arena.

The price and functionality of these new terminals suggest that IBM may be more successful this time around in its attempt to capture market share. If the company succeeds, it will most likely be at the expense of some of the independent, smaller companies lacking the resources of IBM or other computer giants.

Whatever happens, it seems to be a fact of life in the computer industry that when a market is in a state of upheaval, buyers tend to stick with the more stable vendors. No one is more stable than IBM. On the other hand, at these prices, does vendor loyalty and stability even enter into it? Possibly not.

The market remains, however, an important one for data processing department and MIS department managers who require a large number of terminals to satisfy their department's data entry and data retrieval needs.

Special Report

Telecommuting stretches nets beyond office setting

Employers, workers reap benefits from astute terminal use

By E. Gordon
Sent to CW

At regional sales offices, airline ticket booths and department store candy counters, the terminal stands as a symbol that MIS departments have delivered remote access, data entry and computing power to workers in far-flung locations.

If MIS managers want to extend resources further, terminals can play

a role in yet another group of remote locations — alternate work sites such as workers' homes, that lie beyond the four walls of the traditional office. With telecommuting, employees can electronically bring work to their employees instead of physically bringing the employees to a central work location.

The idea of telecommuting is simple: Employers allow some of their work force to spend part of the work week at one or more kinds of remote work locations. These remote locations have payoffs for both the employer and the employee.

Employers benefit because they stretch available office space by

shifting some work and workers to remote sites; they also improve their recruiting efforts and their ability to retain key staff members. Employees come out ahead because they spend less money for commuting, meals and office "uniforms" and can work on a flexible schedule.

When work hours shift, employees also garner payoffs in terms of mainframe capacity management. Firms that let people work from home can delay mainframe capacity additions by balancing work loads around the clock.

Only tradition demands that everyone arrive at work by 8:15 a.m.; the night owls of the business world

(and there are many) are more than pleased to munch in around noon and work until the wee hours. If enough terminal users make such a time shift, or even a less dramatic one, the MIS manager has a better chance of putting off capital appropriations for more mainframe power.

The popular image of telecommuting includes a personal computer tied to an office, but this view ignores the important role of terminals attached to a network. In this age of micro mania, managers must remember that the terminal is still a perfectly adequate tool for many people. A few reminders should make that point clear:

■ Despite a slow but sure evolution in personal computer size — from desktop to huggable to portable to laptop — terminals are still often easier to move around.

■ Many tasks that have had special-purpose terminals designed for them are well suited, by their nature,

”

The popular image of telecommuting includes a personal computer tied to an office, but this view ignores the important role of terminals attached to a network.

to telecommuting. Airline and hotel reservations, data entry and word processing are good examples; these tasks have easy-to-measure beginning and ending points and often do not require the person doing them to have frequent contact with other people in an office.

■ Growth in personal computer use notwithstanding, a lot of plain vanilla time-sharing still goes on, and terminals work very nicely for time-sharing. A good example is a processing-intensive scientific application. In performing such a task, a remote worker spends little time online with the host, needs little or no local computing power and can work as effectively in his den as in costly office space.

The technical issues involved with the use of terminals for telecommuting generally pose no problem. MIS and telecommunications managers, in fact, have a lot more experience in setting up and fine-tuning terminal-based networks than they do in coping successfully with the thorny problems of micro-mainframe links.

The real challenge in making telecommuting successful is avoiding potential human resource and supervisory problems. To do so, managers must pick the right employees and managers to be involved and must

Continued on page 100

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Gordon is president of Oll Gordon Associates in Monmouth Junction, N.J. He specializes in implementing telecommuting programs and is editor of the monthly newsletter "Telecommuting Review."

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Integrated terminals fulfill communications, data needs

By David B. Schneider
Special to CW

Most office workers and managers need, and, especially, most executives do not need or want general-purpose computers on their desks.

Generally, they want something unobtrusive that gives them access when they need it to information residing somewhere else. Once in a while, these users also want access to computing power.

These realities require that office workers have small-profile terminals that primarily serve communications needs and occasionally serve data needs. This is where integrated voice/data terminals come into their

own and begin to make sense.

Integrated terminals can be less expensive than personal computers that have been upgraded with voice capabilities. With highway keyboards, they can take up little desk space; with soft keys, icons or mice, they can be easy to use.

Because voice/data terminals are so useful, corporate planners and anyone involved with end-user computing should strive to achieve a proper awareness of the devices' status and capabilities.

Most systems on the market have some of the following capabilities:

- Advanced telephone functions, such as autodialing.

- Desktop computing, with advanced office automation functions.

- Store and forward capabilities for voice messaging.

- Use of existing telephone wiring for both voice and data.

- Simultaneous access to multiple applications, with windowing and interruption capabilities.

- Soft key functions, icons and mice.

- Data communications, with access to remote computing power.

Once managers understand these capabilities, they quickly realize the importance of integrated devices for information access and decision support. Integrated voice/data terminals

essentially replace the telephone and the personal computer by providing sophisticated functions for both voice and data, with combined communications connectivity.

Organizations are beginning to understand this potential. In turn, they are installing systems in increasing numbers.

Still, many business organizations are showing some hesitation. Some, for example, are testing voice/data capabilities under trial agreements before they make commitments to vendors. These firms are targeting middle and upper level managers, who have generally been left out of office mechanization.

Other managers are even more reluctant. Before they act, they want to know what the future holds. For the most part, their organizations fall into one of two camps: those waiting for advances in private branch exchange technology and those waiting for integrated terminal vendors to establish themselves.

PBX technology. Some organizations are waiting until PBXs with well-integrated switches come to market. Such systems should be able to handle the volume of data calls that are inherent in integrated terminal use better than current PBXs do.

By digitizing voice communications, advanced PBXs can multiplex voice and data signals along the same wire. This coupling can reduce the extensive cabling system that is necessary to support many current integrated terminal offerings.

Such PBX products will let organizations use existing telephone wiring instead of recabling buildings for data communications needs. They will also enable workstations to be moved easily from one location to another, wherever telephone access is available.

Vendor establishment. Other companies are taking the wait-and-see approach to integrated voice/data terminals because of the embryonic nature of the industry. They do not want to risk dealing with vendors that may not be here tomorrow.

Although major computer and PBX vendors have entered the market, smaller vendors are leading the way. These small companies offer the best integrated systems currently available, those that integrate voice and data by way of a digital minicomputer.

Several of the companies are supported by venture capital or corporate investors. Most, however, are relatively unknown. All have difficulty marketing their products, and all present some risk to potential customers.

Within the next year, these companies will have to prove themselves in competition with major vendors, which will begin to push personal computers and departmental systems with integrated voice capabilities. Only those firms that have a strong end-user sales force or substantial third-party backing will have any success in moving their products.

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Schneider is manager for the development and implementation of advanced office systems for Pacific Northwest Bell Telephone Co. in Seattle.

Special Report

Novel devices let firms distribute power beyond traditional boundaries

RENO, Nev. — In the interests of performance, price and aesthetics, a bank here has chosen integrated voice/data terminals rather than personal computers or data terminals as the devices of choice for managers' desks.

First Interstate Bank of Nevada, a \$2.5 billion banking system with 68 branches throughout the state, has installed approximately 80 of the integrated terminals — Displayphones from Northern Telecom, Inc. — in

the past year. It plans to double that number within the next year, according to Dave Dutton, vice-president and manager of bank systems.

"Banking is not just opening accounts and cashing checks any-

more," he said. Rather, it entails providing products and services to customers within a competitive marketplace. To prosper in that marketplace, First Interstate of Nevada is automating back-office tasks for its end users so they can concentrate their energies toward meeting customers' needs.

The voice/data terminals are one step in that direction, Dutton said. "[They offer] rapid display of predefined information... to officers of the bank who require immediate ac-

cess to information necessary for their daily business decisions."

Each terminal has an internal 1.2K bit/sec. modem, and each is attached to a protocol converter that enables communications with the bank's host, a 16M-byte IBM 3083.



First Interstate Bank of Nevada managers, including Vice-President Dave Dutton (above), use integrated voice/data terminals for access to information.

The terminals can dial into any one of 11 ports that they share on the mainframe's controller. Each Displayphone also supports a small printer.

Dutton said First Interstate of Nevada tested a range of different devices and decided to install the integrated voice/data terminals because they met most of the bank's critical needs better than other options did.

Performance. The terminals offered telephone features like conference calling and speed dialing along with IBM 3270 terminal emulation suited to the needs of managers and officers. Dutton said managers need full on-line access capabilities but do not use them often enough to justify the installation of dedicated mainframe terminals.

"With the Displayphones, he said,

managers can access both CICS and TSO. They tap into CICS for simple data inquiry and use Information Builders, Inc.'s Focus data base management system under TSO to message and analyze data and to enter specialized information. Dutton said the bank protects its production data by giving managers access to strip files rather than masters.

Price. The terminals were cost-effective, Dutton said, both because of the initial price, which was lower than the combined price of a 3270 look-alike and a telephone, and because of the operating costs, which are lower than those of terminals that require dedicated ports on the mainframe controller. The bank ties about 10 Displayphones into each of the 11 assigned controller ports.

Continued on page 87

USER REPORT

FIRST INTERSTATE BANK OF NEVADA

Problem:

Managers have insufficient access to computing resources.

Solution:

Integrated voice/data terminals.

Benefits:

Increased use of applications software, for a relatively low price.

past year. It plans to double that number within the next year, according to Dave Dutton, vice-president and manager of bank systems.

Dutton said First Interstate of Nevada began installing the voice/data terminals as part of an effort to dis-

NORWOOD, Mass. — A beverage distributor made its order entry faster and more precise, evened out peak demands on its staff and gained an edge over its competitors by letting its salesmen use telephones as order entry terminals.

Whitehall Co., a distributor that sells about \$10 million worth of wine, spirits and beer annually from three warehouses in Massachusetts, began reaping these benefits in 1981

The system, known as Pavlov to Whitehall's staff members and salesmen, is based on two minicomputers that allow telephones to act as terminals to Whitehall's host — a 4M-byte

Prime Computer, Inc. 850. The minis, Perception Technology Corp. BT-11s, run software that accepts telephone calls, alerts the host to incoming messages and decodes the host's replies into digitized voice messages that help callers place their orders.

Each mini supports eight incoming phone lines. Bailey said the configuration supports an average of 500 orders a day and can handle more than 1,000 orders on days that fall during peak buying seasons.

The voice-recognition minis tie into inventory and credit files maintained under Prime's Midos data base management system on the host. Through the link to the data

A conversation with Pavlov

When a salesman calls in to the voice-response order entry system at Norwood, Mass.-based liquor distributor Whitehall Co., a digitized female voice greets him. "Hello. This is Pavlov," the voice says. "Please enter your ID number and password."

The salesman keys in his identification number, presses the star button on his telephone keypad, keys in his password and presses

the phone's pound button to send the information to Whitehall's host.

Pavlov checks the ID number and password, both for validity and to determine his next response to the salesman. Salesmen for different companies use the system to place orders, and Pavlov's next message acknowledges which firm the salesman represents.

The salesman then keys in a two-

Continued on page 82

USER REPORT

WHITEHALL CO.

Problem:

Batch order entry stalls delivery operations.

Solution:

Voice-response system, using phones as terminals.

Benefits:

Smooth delivery cycle; edge over competition.

after it installed a voice-response order entry system. According to George B. Bailey, the firm's MIS director, "It's a highly successful installation."

base management system, Pavlov tells salesmen immediately whether an item they want to order is in stock and whether or not a customer's credit is in good standing. As such, Bailey said, the system overcomes two problems that once stalled Whitehall's ordering and shipping.

Before the firm installed the voice system, salesmen either dropped off hand-written order forms at one of the firm's warehouses or called in their orders to clerks. From the order forms or the phone calls, the clerks entered orders on intelligent key-punch terminals and submitted the data to the host in batch mode.

Whitehall's staff waited until business closed at 5 p.m. to initiate

its computer runs, which assigned inventory to customers' orders for shipment the next day. Because of the schedule, some stock shortages did not surface until after working hours, Bailey said, and parts of customers' deliveries got delayed.

Credit problems that showed up during the computer runs also delayed deliveries. Whitehall's credit manager could not straighten out the problems until the following business day and had to cancel shipments until then.

Batch processing further hindered Whitehall's operations because it gave salesmen no incentive to place their orders early, Bailey said. The

Continued on page 82

Special Report



Voice-recognition order entry helps Whitehall Co.'s shipping proceed smoothly.

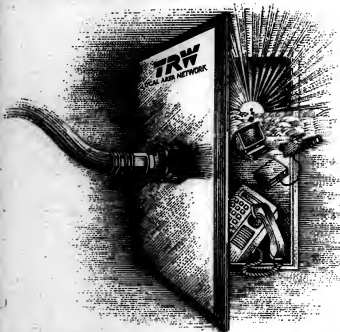
From page 61

User report:
Whitehall Co.

system assigned inventory according to the size of a shipment rather than the time the order was submitted.

"There was no particular benefit of getting orders in early," Bailey said, and salesmen tended to submit their requests late in the day. Whitehall received 80% of its orders during afternoons and had to bring in clerks to work during that time only.

With the voice-response system, assignment of stock for shipment to customers takes place as soon as a salesman completes his phone order. This timely response has encouraged salesmen to place customers' orders as soon as they receive them, throughout the day, Bailey said.

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Credit denials no longer delay shipments as often as they did under Whitehall's old system because they are made during the working day, when salesmen still have time to iron out problems with their customers and Whitehall's credit manager. Bailey said the chance of money-over problems "before they become a cause celebre" has helped the firm maintain good customer relations.

Similarly, stock shortages do not hold up shipments because salesmen can request substitutions for any item that is out of stock. Although requesting substitutions can be tiresome, Bailey said, it is better than having an order postponed.

The voice-response system has also helped Whitehall speed up the ordering process. Bailey did not know exactly how much time was saved by using telephones as data entry terminals, but he said the system's speed in accepting orders was obvious. "We know that it's faster, then dictating them over the phone."

He said the best indicator of the system's efficiency was the firm's lean order entry staff. Wholesale operations similar in size to Whitehall typically need between 14 and 16 clerks to handle peak volumes, according to Bailey. Because most orders come in via Pavlov, Whitehall generally keeps only five or six clerks on hand.

The system has also reduced data entry errors, mainly because it eliminates the transcription of written or telephoned information to key-punched data, Bailey said.

Bailey said he was positive the system gives Whitehall an advantage over its competitors because many people have told him so. "Our customers tell us, our salesmen tell us, and our competitors tell us," he said.

From page 61

A conversation
with Pavlov

part account identification and presses his pound button to enter the information to the system. After Pavlov receives the account identifier, it issues a voice message that tells the salesman how to proceed with his first item order.

The salesman follows the directions and enters an order for one type of liquor. If the liquor is in stock, the item order is complete, and Pavlov asks for a second item order.

As long as each item a salesman orders is in stock, Pavlov continues logging item orders and requesting orders for more items. It helps salesmen keep track of their line orders by saying, "Item 10, please," for example, after it logs item nine.

To signal the end of an order, a salesman keys in the word "end" (3-6-3) and presses the phone's pound button. When Pavlov receives this message, it tells the salesman how many bottles and cases he has ordered. If the total is incorrect, the salesman enters "no" (6-6) and must reenter his entire order. If the total is correct, the salesman enters "OK" (6-6), which initiates a credit check.

If credit is approved, Pavlov indicates that the order has been placed and asks the salesman if he has another order to enter. If he does, he proceeds with the next order. If he is done, the salesman enters "end." Pavlov then replies, "Thank you for calling" and hangs up.

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Screen compression aids bank's remote, local users

SEATTLE—A bank increased the efficiency of data transmissions among its branch offices after it installed a screen-compression module for its IBM 3270-type terminals that more than halved the amount of data in transmission.

Washington Mutual Savings Bank, an institution

with more than 60 branch offices in Washington and \$3.5 billion in assets, installed the screen-compression module on its 24M-byte IBM 3083 mainframe early this year. Since then, it has cut its average daily transmissions by 54%, according to Shawn M. Shawhan, a senior software analyst in

Washington Mutual's technical support group.

The bank's acquisition of the software module, BMC Software's, Inc.'s 3270 Superoptimizer, was the most recent in a series of moves toward improving response times on Washington Mutual's CICS network of IBM 3270 and look-alike termi-

nals. The network includes about 90 local terminals and about 450 remote terminals that communicate via leased lines with an IBM 3705 controller on the bank's mainframe.

Washington Mutual's first move toward reducing data transmissions, made early in 1984 to quell user complaints

of poor response times, was to develop and install a homegrown screen-compression module. The product worked well; it reduced CICS data streams by about 24% and produced noticeable improvements in response time, Shawhan said.

He soon questioned, however, whether the homegrown version was performing as well as a commercial screen-compression module might. He compared the bank's module with a number of offerings, including BMC Software's 3270 Optimizer, an early version of the software Washington Mutual uses now.

"Our evaluation showed that there was no comparison," he said. "With the BMC product we immediately saw a 29% reduction in the [size of the] data stream." In addition, Shawhan said, the commercial product came with better documentation than the homegrown module, produced better network utilization statistics and had a better facility for tracing problems.

"Probably the only advantages our own version of the optimizer had were that it was already in place and it was free," Shawhan said. These advantages were sufficient, however, for the technical support group to recommend retaining the homegrown module.

Second move

The bank was forced into its second move in July 1984 when it began running a new release of CICS on its mainframe and the homegrown module stopped working. "Our department was going through such an expansion that we couldn't spare the people or the time to write new code," Shawhan said. "So I contacted BMC, and we purchased... the 3270 Optimizer."

Washington Mutual ran the software from August 1984 to February 1985. Its installation resulted in an actual data reduction of about 29%.

In February 1985, the bank made its third move toward greater reductions in the amount of transmitted data. BMC offered to let Washington Mutual serve as a beta test site for its enhanced product, the 3270 Superoptimizer, and the bank agreed to try the product. After two weeks of debugging the software against test data, the technical support group put the screen-compression module into production. The results were impressive, according to Shawhan.

"Once we installed Superoptimizer, even our local terminals showed some im-

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Special Report

proved response times," he said. "People in our remote sites, of course, reported even more excellent response times."

He said the bank normally would not compress data for local terminals because the overhead outweighed the advantage of doing it. "However, with the Superoptimizer we saw enough of a difference in response time that we decided to use the product for all of our terminals."

On average, local terminals logged reductions of 50% in the amount of data they transmitted, and remote terminal transmissions dropped between 60% and 65%. "To put it in perspective," Shawhan said, "on a normal day employees throughout the network collectively produce 100 million characters. With the Superoptimizer, less than 50 million of those characters are actually being sent out."

Modified data screens

The bank soon discovered that the screen-compression module lent itself especially well to applications that required the repeated transmission of modified data screens. The software compressed the data so that only the modifications got retransmitted, rather than the entire screens. On such applications, Washington Mutual logged reductions of as much as 99% in the amount of data it transmitted.

Shawhan said he has not calculated corresponding reductions in response times, but he said users' reactions and the results from some sample applications indicate that response times have improved significantly.

For a transaction in which bank representatives call up reports of checks cashed against insufficient funds, for example, response times have become, on average, between 50% and 60% faster. Some inquiries that had required between 5 and 7 seconds to process now take about 1 second.

When the screen-compression module first went into use for this application, users let the technical support group know of their appreciation, Shawhan said. "Never having experienced such excellent response times, some of them even called us, thinking there was a problem with the computer."

Washington Mutual currently is redesigning its communications network to include multiplexers in key cities. The efficiencies of the redesign, coupled with line savings from compressed data transmission, should cut the bank's annual network costs by 29%, Shawhan said. By the end of 1986, the bank plans to upgrade its modems from 4.8K to 9.6K bit/sec. for further efficiency on the network.

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User report:
First Interstate

The port sharing has not been a problem, according to Dutton, because Displayphone users do not generate a high volume of data requests. In addition, the ports are linked in a chain to prevent tie-ups; if one is busy, it passes on incoming requests to the next.

Aesthetics. The Display-

phone's footprint is smaller and sleeker than that of a traditional terminal or a personal computer, according to Dutton, making the device attractive for placement on an executive's desk.

Although the terminals fell short in some respects, such as modem speed, they met the bank's critical criteria relatively well. "While we're not 100% satisfied," Dutton said, "our level of satisfaction with Displayphone

is very, very high."

Different groups of users apply the terminals' capabilities to different types of tasks. Bank officers who have responsibility for account relationships, for example, tap into the data base to determine the makeup of customer groups; they also insert comments into customer data files. Service representatives in branch offices use their Displayphones to establish new accounts and

make changes to old ones.

The integrated voice/data terminals have helped the bank move toward its goal of distributing computing power to end users, Dutton said. "Because Displayphone provides easy access for non-technical staff, our managers have successfully accessed our IBM computer programs, which, of course, greatly increases the utility of our computer's application programs."



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Special Report

Classification of IBM 3270-type terminal use			
High-Volume Data Entry	Order entry, claims processing	Intensive	14-in. color or 15-in. monochrome
Business/Finance	Inventory, accounting, scheduling	Casual	12-in., monochrome or color
Office/Text	Document inquiry and manipulation	Casual	12-in., monochrome or color
Business	Customer service, public utility, order processing	Casual	12-in., monochrome or color
Programming	Development, maintenance	Intensive	14-in. color or 15-in. monochrome

Applications requirements determine usage patterns, which in turn determine what type of display screen best suits an individual user.

Rule guides 3270 buyers

Match hardware to individual needs

By Matt Spieker
Special to CW

A manager who chooses among IBM 3270-type display stations for his organization's users cannot limit himself to a clinical hardware evaluation. A study of user requirements is a more important element of the selection.

Because users and their requirements are tremendously diverse, the manager must understand individual user groups' needs before he can ad-

vance in his selection of terminals. The most common 3270 display station applications fall into one of the following categories.

Data entry. High-volume data entry applications include batch data transcription functions typically associated with order entry, insurance claims processing and similar business activities. Users of these applications spend the major portion of the working day in front of the displays dealing with voluminous amounts of information. They represent about half of all 3270 users.

Engineering and science. Applications in these two fields include design, modeling, simulation and other interactive, problem-oriented programs. Engineers and scientists spend less time at the terminal than do high-volume data entry operators and are best identified as casual users. They constitute about 15% of all 3270 users.

Office and text. The most common applications in these two areas are those that help users retrieve and manipulate documents. Secretaries, writers and managers who produce documents — the main users in this category — rely on their terminals daily, but they do not spend as much time at their screens as data entry clerks. For the most part, they are casual users. Together, office and text professionals account for about 10% of the 3270 user base.

Business. Electronic mail, public data base access and financial analysis are the foremost applications in the business category. Executives, managers and the other professionals that use these applications realize the benefits of information access, but they are casual users at best. They make up about 20% of the 3270 user population.

Programming. Development and maintenance applications account for most terminal use in this category. To perform these tasks, programming professionals use their display screens intensively. Only about 5% of 3270 users are programmers, yet the programming category is an extremely important one for the manager to consider. Programmers often serve as consultants to other user groups, and they are a valuable resource in the selection of appropriate terminals for various applications. Because they determine usage patterns, these requirements provide the framework within which the manager can make his display station decisions.

Casual users often use the display station as a tool to increase their productivity, even though there are alternative means to complete their assignments. They want a small unit that requires minimal desk space. A 12-in. monochrome or color display is usually sufficient for casual applications such as data base inquiry and electronic mail.

People with terminal-intensive tasks such as data entry will be more comfortable with a 14-in. color display or a 15-in. monochrome screen.

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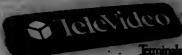
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Special Report

Choices abound in marketplace for 3270-type devices

Evolution has opened a multitude of choices in the marketplace for IBM 3270-type terminals. Managers who enter the market to select terminals for their organizations' users will be confronted by the following features, all of which can foster user productivity: Color displays. Color is

most frequently used in graphics applications, but it lends itself to alphanumeric tasks as well. In alphanumeric applications, color facilitates instant recognition of information. It separates data visually, differentiating types and sources of information and making the data easier to understand. If users

understand what they view, they make fewer mistakes and are more productive.

Some 3270 monochrome displays also offer differentiation through extended highlighting features such as blanking and underlining. Like color, these features help users make sense of what they see.

Graphics displays. The price of graphics displays continues to decrease. As price drops and selection broadens, 3270 users will find no end to the number of applications that benefit from the inclusion of color graphics.

Graphics is not limited to the production of charts and

diagrams. It can be used to produce characters of different sizes, special fonts, mathematical signs and symbols and characters from foreign language alphabets.

Scrolling capabilities. Scrolling allows terminal users to access more than the familiar 80 columns by 24 rows of data. Users can now scroll backward and forward vertically through a 7,640-char. buffer. This feature is especially beneficial for inquiry and update transactions.

Keyboards. Even the keyboard continues to be improved as part of the 3270 evolution. The introduction of the 122-key keyboard, which brings increased productivity to the users' fingertips, is especially noteworthy.

Many functions that required two or more keystrokes on an 87-key keyboard are reduced to a single stroke on the expanded versions. If the keyboard supports a record/playback feature, users can assign sequences of frequently used keystrokes, such as those in a logon, to programmable function keys. An operator can then play back the sequence by initiating a single keystroke.

Input devices. A number of auxiliary input devices are available to make 3270 users' tasks easier. Pointing devices (the light pen, the mouse and the touch screen, for example) facilitate menu-driven applications. Input devices such as bar-code wands and magnetic card readers facilitate data entry tasks.

Each of these devices is more efficient than the keyboard for specialized applications.

Screens. Printers. The role of printers is also changing with the 3270 display evolution. Traditionally, printers have been shared among users within a controller cluster, but this configuration is impractical in situations where multiple users call frequently for printed copy.

Printers attached directly to the display screen eliminate the queuing problems associated with shared printers. Screen printers are also more practical than shared printers for users who frequently print on special forms. Users can keep their special forms on their own printers; they need not change forms repeatedly on a shared printer.

Finally, screen printers do not require a port on the controller. If enough users require printed copy, the elimination of controller ports can result in substantial cost savings.

— Mark S. Spitzer

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DEC vs. The Contender is a

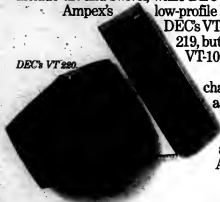
In this corner: DEC, with the VT 100/220—real heavyweights, listing at more than \$1500 and \$1095. Over there, the contender: Ampex, with its fully protocol compatible 219 and 220, both weighing in under \$750.

How does the competition measure up?

DEC's 12" green screens are 33% smaller so visibility's limited. (Ampex offers 14" amber or green screens at no extra cost.) Ampex's moves include tilt and swivel, while DEC only tilts.

Ampex's low-profile keyboards adjust for slope; DEC's cannot. DEC's VT-100 keyboard layout is similar to Ampex's 219, but handicapped by its function keys: the VT-100 has none, our 219 has 16.

DEC's VT 220



Instead of the VT-100's two resident character sets, Ampex's 219 has nine—so it can adjust easily to performing in foreign arenas.

And our 219 offers two 80-column pages of display memory standard plus two more as an option. But that's not all that makes Ampex an odds-on favorite.

In this corner - wearing the non-glare amber screen - the contender; the formidable Ampex 220.

Like the 219, it's a technical knockout.

Our 220's loaded with features DEC forgot: A fully-buffered bidirectional printer port. Block mode. Variable speed smooth scroll. A programmable user line. And three more optional pages of display memory.

The Ampex 220's keyboard layout is similar to DEC's VT-220. But instead of 256 bytes of volatile memory for its function keys, Ampex has 400 bytes of nonvolatile memory.

There's one more thing in the 219/220's corner: Ampex. With a one year warranty. International service. Plus more than 30 years of video, computer peripheral and manufacturing expertise.

Call Ampex Computer Products Division at 800 538-7838. 800 231-1036 in California. Get the details you need for a decision. You'll find it's no contest.



The Ampex 220. (219 similar, not shown.)

AMPEX

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Ampex. Technical Knockout.

Special Report

From page 75

Buyers getting more for money

The year 1984 will be remembered as the year the terminal market went commodity, with all players scrambling for market share. Therefore, to suggest the terminal market is a highly profitable industry for many is inaccurate.

However, as tough as times are, the companies

have not stopped introducing new products.

The ASCII market

The ASCII side of the terminal market has been shaken by drastic price reductions. This was the first market segment to go commodity. Qume Corp.'s introduction of the 4306 QVT 101 in March put a great deal of pressure on all ASCII terminal vendors.

It was not until Wyse

Technology, Inc. announced the WY90 in August that any hope appeared for vendors to pull in respectable profits from such a low-cost device. Wyse cut its overhead costs dramatically by placing all circuitry on one board.

While the ASCII market was repositioning itself in terms of price and performance, IBM appeared on the scene with two new products, the 3161 — selling for \$696 — and the 3163 —

priced at \$1,096. Up until this point, IBM had only supported one ASCII terminal, the 3101. With the introduction of the 3161 and the 3163 and the withdrawal of the 3101, IBM's strategy became volume driven.

It is unknown what effect these products will have on the market. Although they are lacking in features and price, the power of the IBM logo cannot be undersold.

IBM will go after market

share in the ASCII arena for a number of reasons:

- The company works best in commodity markets.
- It is actively pursuing the multiuser market as demonstrated by its Personal Computer AT and the recently announced System 36/PC.
- It is attempting to broaden its reach beyond the Systems Network Architecture environment and into non-IBM territory.

IBM's other successes

IBM's recent activity in the ASCII terminal market has not drawn it away from its other successful terminal lines. In 1984, IDC estimated IBM's shipment market share in the 3270 market at 61% and 88% for the System 34, 36 and 38 families of terminals. IBM's momentum continues to be strong in 1985.

Plug-compatible vendors, particularly in the 3270 market, are finding it more diffi-

99

The personal computer, a one-time major threat to the CRT-based terminal market, has yet to prove itself as a viable, price-competitive alternative.

cult to stay afloat as IBM's product line surges forward. Telex Computer Products, Inc., TTY Courier Terminal Systems, Inc., AT&T, Lee Data Corp. and Memorex Corp. are the significant 3270-compatible makers left.

Telex gained stature in June 1984 when Raytheon Co. purchased it. It now ranks second to IBM in market share. AT&T — Teletype was folded into AT&T on Jan. 1 — is aggressively going after the 3270 market. In November they will introduce a new 3270-type line.

The personal computer threat

The personal computer, a one-time major threat to the overall CRT-based terminal market, has yet to prove itself as a viable, price-competitive alternative.

Market share has definitely been lost to the micro but not to the degree the industry had at one time predicted. IDC estimated that in 1984 the personal computer averaged 15% of the total 3270 and System/34, 36 and 38 environment base.

This is not to suggest the personal computer is not to be taken seriously as a contender in the terminal market. It cannot be overlooked, but neither can advancements in networking and software development.

Our ad isn't any better than theirs.



Our terminal is.

If you want to make a very smart decision about which DEC compatible terminal to buy, we need to talk.

Because when you have this much information and hype to sort through, you need to compare more than ads. You need to compare terminals.

Compare the VISUAL 220 to all of the above. Most of them don't have full DEC VT 220 emulation. Only a small fraction can match VISUAL's 30 host-programmable function keys, 14" tilt-swivel screen,



4 pages of memory and an optional keyboard. None of them offer a full family of DEC VT 200 series compatible terminals such as our VISUAL 240 and VISUAL 241. And when it comes to price, the competition is very very scarce.

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Windowing units speed up service for insurance firm

HARTFORD, Conn. — An insurer firm started offering its field agents and their customers faster service after its underwriters began using windowing terminals in place of single-function VDTs.

The terminals, which allow users to execute up to four simultaneous host sessions, have helped Connecticut Mutual Life Insurance Co. make strides toward meeting an important corporate goal, according to Jim Dawson, director of network support services. "Connecticut Mutual wants to become more customer oriented," Dawson said, "and this equipment has helped us improve our responsiveness."

Until recently, the firm's underwriters used single-function terminals to process prospective clients' policies. The terminals were a problem, Dawson said, because they did not allow for the exchange of information between the two policy software systems that Mutual Life uses.

Two single-function systems

The company has one system for information on pending policies, which is used primarily by underwriters. It has another system for sales statistics, electronic messaging and current policies, which is used mostly by field agency personnel. The two run independently on a set of IBM 3081 mainframes, each with 24M bytes of memory.

To process a policy with a single-function terminal, an underwriter had to log on to the pending policy system and check to see whether policy information was complete. If it was not, the underwriter had to make a manual note of the deficiency and log off the pending policy system. He then had to log on to the sales system, type in a request for additional information and send the request electronically to the field agency that had submitted the policy.

Last spring, Connecticut Mutual began installing Lee Data Corp. Model 1221 windowing terminals to help overcome these burdens. Only one of the firm's four regional underwriting groups currently uses the windowing terminals; Dawson said the other three groups will get them soon.

The underwriters who have the windowing terminals can do all their work without logging on and off the two software systems and without jotting down notes as they go along. Dawson said an underwriter can log on to both systems concurrently, keeping either in a separate window. Underwriters can also copy infor-

mation from one window and move it to another.

Dawson said Connecticut Mutual had not yet calculated its underwriters' exact time savings and chose not to release preliminary findings. He said the firm felt confident, however, that the windowing terminals offered a significant advantage over

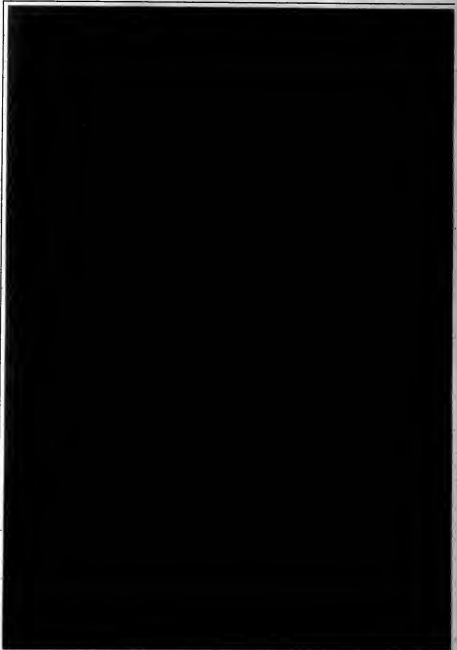
the single-function VDTs.

As an indication of that confidence, he pointed out the firm's commitment to the windowing machines. Connecticut Mutual has installed about 190 Lee Data Model 1221s to date. Dawson expects to bring in about 400 more before the end of next year unless terminal technol-

ogy or micro pricing changes drastically. "Right now," he said, "the windowing terminal is the most cost-effective way to do the job."

In addition, he said, field agency personnel and users in the home office have commented favorably on the terminals' usefulness. In-house users have reported an aver-

age increase of 25% in the amount of work they can accomplish with the windowing terminals as opposed to the single-function ones. A manager in the underwriting group, for example, reported to Dawson that he now needs only three data entry clerks to perform the work formerly done by four.



No sacrifices with raster graphics display

Allows high resolution, no flicker at low cost

Karen Blevins
Special to CWT

High-performance graphics applications — those in which high resolution cannot be traded for other benefits like low cost — have historically confined users to either storage tube or vector refresh display terminal technology.

But interactive, bit-mapped raster graphics display technology has changed all that by dramatically improving the price/performance bal-

ance. It allows users of high-end applications such as simulation and graphics design to get the high resolution they need without sacrificing flicker-free display, area-fill capabilities, low cost and other desirable features.

As such, raster graphics display overcomes disadvantages of both storage tube and vector refresh technology.

Storage tubes are relatively inexpensive, and they have very high pixel resolution — typically 4K by 3K. But they offer only limited interactive and area-fill capabilities. In addition, they flash when the screen is erased and have no color- or so-

lids-fill capabilities.

Vector refresh technology also offers very high pixel resolution — typically between 2K by 2K and 4K by 3K. It surpasses storage tube technology in that it provides interactive capabilities and limited color and area filling. But vector refresh displays flicker, and they are expensive.

Raster display terminals, which are relatively inexpensive, typically offer pixel resolutions slightly above 1K by 1K; some, however, approach the 3K by 2K mark. In addition, these terminals offer superb color capability and shading features that allow for solids modeling; they are

Estimated MOS dynamic random-access memory prices

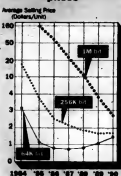


Figure 1. Chip prices help decide what features users get for their money.

also virtually flicker free.

By offering these capabilities at a relatively low price, raster display technology has prompted some important trends in the display marketplace.

A movement toward more graphics terminals with better features. Recent research into graphics terminal manufacturing shows that the overwhelming majority of today's high-end products are raster terminals.

Most have pixel resolutions of either 1,024 by 1,024 or 1,280 by 1,280. A small concentration of products is available with 1.5K-by-1K-pixel resolution, and a few products are available with other pixel resolutions above 1K by 1K.

The majority of these terminals use 19-in. screens, and most display

Devis is a research analyst for the Graphics Terminal Industry Service of Datquest, Inc., an electronics market research firm based in San Jose, Calif.

High-end color graphics terminals, estimated average list price



Figure 2. Prices should drop by almost one-third between now and 1989.

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Special Report

between 16 and 256 colors. Some use new chip designs for fast display list processing.

A decline in terminal prices. Prices for high-resolution terminals are rapidly decreasing — they now start at approximately \$10,000 — while performance is increasing, primarily as a result of lower prices for memory chips.

Users can expect future generations of products to provide even greater performance at lower prices.

Because the computational complexities of high-end applications require great processing capability that can slow down a host computer, manufacturers are providing more intelligence in their terminals.

This local intelligence increases graphics processing speed and frees the host for more general-purpose functions.

The current prices for chips that have specific memory capacities will factor greatly into the future price/performance equation for graphics terminals.

A typical high-end graphics terminal, for example, requires 512K bytes of display list memory. This can be provided by 64 chips, each with 64K bits of dynamic random-access memory (RAM); 16 chips, each with 256K bits; or four chips with 1M bit apiece.

The current average price for a 64K-bit dynamic RAM chip is \$1.03; the price for a 256K-bit chip is \$3.73; the average price for a 1M-bit chip, which is new this year, is steep — \$162.50 — but it is expected to be approximately \$2.50 by 1990. Today, it is more economical for manufacturers to use 256K-bit chips than 64K-bit chips (see Figure 1).

Availability of lower cost color. The price of memory for any given screen resolution increases proportionately to the number of colors that can be displayed simultaneously. Because of this, cost has traditionally been a barrier to the use of color with the large, high-resolution screens that are used in high-end applications.

Use of color is becoming more widespread, however, because memory prices have dropped and users have become more aware of the benefits that color offers. Color is now accepted as a useful design tool, and it is almost exclusively found within the domain of raster display technology.

Dataquest, Inc., a market research firm based in San Jose, Calif., estimated that half of the raster graphics terminals manufactured in 1984 had color capability. In addition, shipments of color terminals seem to be growing faster than those of monochrome tubes and should

represent half of all shipments by 1987.

Graphics terminal manufacturers can be expected to take advantage of current chip prices to offer users better performance at lower prices. Dataquest estimated that the average price for high-end color graphics terminals that use 64K-bit dynamic RAM chips should drop by almost one-third between now and 1989 (see Figure 2).

Future bright for raster graphics display

Raster graphics display has caught on with users of high-end graphics applications because it offers a better balance of price and performance than either storage tube or vector refresh technology.

This was not always the case, however. Until recently, raster graphics display technology had two major drawbacks:

■ Its memory-intensive nature, which elevated terminal prices.

■ Its resolution, which was in the medium range.

It overcame the first hurdle in 1983, when prices for memory chips — and thus for color and speed — began decreasing.

Continued on page 100

Fine-tuning workstations screens out VDT discomfort

By Peter Wagner
Special to CW

Although studies remain inconclusive regarding the health effects of VDT radiation, a clear picture is emerging of many VDT users experiencing a variety of muscular aches and pains, stresses and visual discomfort. Fortunately, these problems can largely be avoided through education.

VDT users can learn how to adjust workstations and the surrounding environment properly to fit their individual needs, or more formally stated, to create an ergonomically sound work environment. Users can also learn and incorporate exercises into their daily routines to limit VDT-related discomforts (see story page 90).

The primary components of a workstation are the furniture, the screen and keyboard, accessories and the surrounding environment. The workstation furniture consists of a worktable and chair. Although the adjustment of a workstation depends primarily on what is most comfortable and effective for an individual, there are general guidelines for each component.

These guidelines should

er's body size and the task that is being performed. The ideal seated posture for an individual using a VDT is as follows:

- Feet should be flat on the floor or on a footrest.
- The angle between the lower and upper leg should be slightly more than 90 degrees. (The chair seat should

not cut into the thighs.)

- The chair's backrest should support the middle to lower back, and its angle should be either vertical or slightly tilted back.

- Fingers should rest on the keyboard comfortably with the hands positioned slightly higher than the elbows.

Users should adjust chairs and tables to attain this posture. If neither piece of furniture is adjustable, or if they have limited flexibility, one option is to make do. For example, a phone book provides a lift for feet that don't quite touch the floor, and a pillow or cushion can add padding to a chair that

doesn't offer adequate middle- or lower-back support.

Some of the most common complaints associated with VDT use result from improper adjustment of the keyboard and screen. In particular, even if the task changes, an operator may not shift the placement of the terminal. For example, data entry

incorrect posture. This user's chair is too low; she would be more comfortable if she unwrapped her legs from under her chair and raised her seat. In addition, her workstation table is too high, and her copy stand is placed too far to the right.

be followed regardless of whether or not an employee works on the VDT for short periods or for the entire workday.

A workstation should be arranged according to the us-

Wagner is marketing coordinator for Your Side of the Screen, an educational program designed to help VDT operators and their supervisors cope with the ergonomic and health aspects of VDT use. The program is offered by Consulting Statisticians, Inc. of Wellesley, Mass.



Special Report

requires very little screen or keyboard viewing. Because the operator focuses on the document from which the data is being extracted, the keyboard should be placed in the most accessible location with the document at a comfortable viewing distance.

On the other hand, when performing data inquiry, the screen and document play an equal role. If the bulk of an operator's work is data entry and he then switches over

for a brief data inquiry task, adjustments must be made. The screen must be brought back to a manageable position so that the operator is comfortable.

Before a VDT user begins a task, he should think about what his focal point will be — the screen, the keyboard, the document or a writing pad. The user should then take a second to adjust these features into the most comfortable position.

Another problem resulting from a misplaced screen is glare. VDT screens, regardless of whether or not they already have a glare filter, should be placed perpendicular to the windows or away from windows altogether. Filters are not always recommended because they tend to distort the characters. Glare can also be avoided by proper placement of lighting fixtures. Desk lamps should never be directed onto a display terminal screen.

A comfortable workstation extends beyond the immediate furniture and equipment in the area. Of equal importance is the surrounding environment. Important components of the environment include room temperature, noise level and visual distractions located near a VDT. It is difficult to suggest an ideal room temperature or to define the recommended decibel noise level since both

vary according to individual tolerances.

The steps for achieving a comfortable and ergonomically correct workstation must first be learned and then practiced until they become as routine as adjusting the rearview mirror and seat belt in a car. Investing the minimal amount of time and energy required to learn more about these issues will maximize employee comfort and productivity.

By Tom Leach, M.D., M.P.H.

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Correct posture. This user can see her copy stand without straining; her chair's backrest supports her lower back, and her hands are slightly higher than her elbows.

Eyes help vision

Despite proper workstation design, many users have still experienced visual discomfort. To reduce these discomforts, experienced ergonomists often recommend wearing eyeglasses.

These eyeglasses can minimize the effects of sustained near vision and sustained vision to reduce, respectively, eye strain and eye fatigue. They can reduce eye strain and eye fatigue by reducing the eye's workload during the course of the day.

One simple technique for preventing eye strain is blinking. Blinking helps the eyes moist and healthy. Although everyone knows what blinking is, most may not do it in the way that is most helpful to the eyes. It should be a soft, gentle motion requiring no use of eye-muscles.

VDT users who experience eye strain should follow this simple exercise routine:

1. Place elbows on a flat surface with one finger on the outside wrist of each eye and practice blinking by just letting the eyelids close. When this is

Continued on page 102

Special Report

From page 92

Future bright for raster graphics display

With the decrease in prices, raster display terminals became reasonably priced and gained popularity with users of low-end applications.

These users, typical business employees, had no need for high resolution but were attracted by low prices and the availability of color.

Their attraction has been so great that the growth in business graphics, a previously untapped market, has been phenomenal. That growth, in turn, has created a demand-driven market, which has been fueled further by this past year's unprecedented drop in chip prices.

The developments in this low end contributed to the reevaluation of

"

High-end users have a number of color raster terminals from which to choose, at prices as low as \$10,000.

needs by users of high-end applications, who began demanding similar products that would suit their own applications.

These users wanted higher resolution, more local processing power, lower prices, color and more software to run their specialized applications.

Manufacturers listened to the users' demands. In 1984, they began breaking the high-resolution barrier for raster graphics. Their terminals introduced a price/performance level that challenged storage tube and vector refresh products by offering features like solids modeling and low-priced color display.

Today, the high-end user has a number of color raster terminals from which to choose, at prices as low as \$10,000. Many of these products have pixel resolutions of 1,024 by 1,024 or 1,280 by 1,024, and some offer even better clarity.

More vendors can be expected to compete in the high-end raster display market. As they do, they will offer users a wide range of competitive features, prices and applications-specific terminals.

From page 78

Telecommuting extends nets beyond offices

train them to work well when they are separated by several miles instead of several floors.

Some companies have had great success. Their methods can serve as examples for others:

■ J. C. Penney Co. has about 20 telecommuters working from their homes near three of the firm's 13 telephone catalog order centers. The in-home sales associates use Protocol Computers, Inc. PC Networker Terminals tied to the local catalog order center to take calls and place orders. The telecommuting program has been operating for four years in the Milwaukee, Atlanta and Columbus, Ohio, metropolitan areas.

■ Pacific Bell Telephone Co. recently shifted 32 maintenance project implementation specialists out of three California offices in Sacramento, San Jose and San Francisco and

"

The key to successful telecommuting is the astute use of terminals to support employees.

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into their homes nearby. The workers use Videotex Systems, Inc. terminals for electronic mail and to access project files. Projected annual office space savings for this group is roughly \$40,000, and the three office clerks who previously supported the 32 maintenance workers have been assigned to other tasks.

■ Public Service Co. of New Mexico has installed Wyse Technology, Inc. terminals in the homes of about 15 senior managers for after-hours work. It also keeps on hand a supply of loaner kits — each consisting of a Wyse terminal, a 1.2K bit/sec. modem and a protocol converter — for managers who want to work from home occasionally.

The common thread that ties these three examples is the astute use of terminals to support employees — when they or the company chooses to have them work from a remote site. Their jobs are such that they do not need the full computing power and other features of a personal computer.

The three company examples cited above also demonstrate the most exciting aspect of telecommuting: the range of alternate work arrangements that can be used. Telecommuting is not an either-or situation, in which employees are at home five days a week or in the office five days a week. Times and locations can be mixed and matched. Time at a remote site can range from two to four days each week; in almost all cases, workers need to spend some time in their offices. Locations can include a worker's home or an organization's satellite office. Workers can also share space in a branch office or can assemble in what has come to be called a neighborhood work center, a building that has rooms reserved for different companies' use and may include a common day-care center and other amenities.

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A cost justification for ergonomic workstations

You will be an organization for a national VDT operator:	
Salary	\$14,000
Benefits (10% of salary)	\$1,400
Training expense	\$2,000
(100 hrs @ \$20/hr @ 10 per person)	
Other personnel (\$10,000 projected over five years)	\$2,000
Total	\$29,000
Prices for ergonomically correct and pleasant workstations:	
Fully adjustable workstation:	
Chair with arm and fully pneumatic seats	\$551
Fully adjustable VDT	\$800
Total	\$1,351
Nonadjustable workstation:	
Chair with neck-height adjustment, no arms	\$381
Standard VDT	\$400
Total	\$781

Difference between workstations

\$1,351

- \$781

\$570

Rate of savings with adjustable furniture

Assuming a 10% productivity increase for an operator who spends 80% of his day operating (at 70% efficiency)

Annual cost	Productivity increase	Operating time	Hourly savings	Annual savings	Monthly savings
\$29,000	10%	2,080	\$0.27	\$5,704	\$475.33

Payback period

\$570

÷ \$120.87 per month

4.78 months

Difference in workstations' prices
Monthly savings
Payback period

Source: U.S. National Association of Working Women and Services (Employees Organizational Union, AFL-CIO).

Figure 1: The payback period for purchasing an ergonomically correct workstation rather than an ergonomically incorrect one is less than five months.

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Ergonomic workplace improves productivity

Studies show proper setup aids workers

By Karen Muschmann
Special to CW

Health problems associated with VDTs and poorly designed workstations threaten to decrease office workers' productivity, but managers can stave off the decline if they act to protect employees' well-being. It is the manager's responsibility, in fact, to ensure employees' comfort and safety and to afford workers the opportunity to perform at their highest possible level.

Improper equipment can cause increased eye strain; back, neck and arm pain; and stress. All of these cut down an operator's productivity. Ergonomically correct equipment provides a more comfortable and convenient work environment, which fosters increased operator performance and can help reduce absenteeism and turnover.

Connections between office equipment and productivity have been documented in several studies, including the following:

- VDT operators who used standard, nonadjustable office furniture during a four-day study conducted by the National Institute of Occupational Safety and Health (NIOSH) in 1983 showed an 8% to 20% decrease in productivity from day one to day four. From morning to night each day, their productivity levels dropped between 30% and 35%.

- Another NIOSH-sponsored study, conducted in 1982 by Marvin J. Dainoff of Miami University in Ohio, compared operator performance in ergonomically correct and incorrect settings. A group of temporary typists worked for two days at standard workstations and two days at ergonomically designed ones. Their productivity was an average of about 24% greater at the well-designed stations.

Nuesbaum is executive director of 9 to 5, the National Association of Working Women, which has headquarters in Cleveland and Boston.

From page 99

Eye exercises minimize strain

done properly, movement is not felt by the fingers.

- Start slowly, and gradually increase the speed of blinking. Fingers placed at the corners of the eyes should not feel any motion as this is done. If the blinks are tight, practice by blinking gently six times. Next close the eyes and rest for the count of six.

- This exercise should be practiced for about 30 seconds every hour or until the eye lashes can be fluttered without feeling any pulling on fingers.

Blink about once per line when reading and always when a change of focus is needed, such as when looking up from the terminal or if a

As the second study indicates, managers have within their reach one method of increasing productivity and improving working conditions: the installation of ergonomically improved workstations. A good, ergonomically correct workstation should include a terminal that can be tilted and turned, an adjustable desk, a chair with adjustable seat height and backrest height and pitch and a detachable keyboard.

On its own, a properly designed chair can add as many as 40 productive minutes a day — 21 productive days a year — for most office workers, according to E. R. Tichauer, a professor of human factors engineering at New York University.

A fully adjustable workstation — one in which both the chair and the terminal can be adjusted to fit an operator's physical requirements — is not a costly investment, considering its payback in worker productivity.

The difference in cost between a fully adjustable chair and terminal and a nonadjustable chair and terminal, for example, can be recovered in less than five months (Figure 1).

For additional improvements in operator comfort and productivity, 9 to 5, the National Association of Working Women, recommends the following:

- Give intensive VDT users a 15-minute rest break every hour. Such breaks relieve muscle fatigue and eye strain and help reduce the stress that can cut into productivity levels.

- Correct poor office lighting and eliminate sources of direct and indirect glare. Office lighting may be more than twice as bright as recommended for terminal work; and glare from direct light, bright windows, reflective surfaces and the VDT itself adds to the problem.

Adding indirect overhead lighting and putting antireflection filters over terminal screens will help reduce operators' eye fatigue and irritation. Using window blinds or drapes also helps.

- As an added safety measure, encourage all VDT users to have annual eye exams. The American Optometric Association and NIOSH join 9 to 5 in recommending this measure.

momentary blur is experienced.

An example of a recuperative technique that can relieve eye fatigue is palming.

Palming should be done whenever eyes feel tired, including once before going to sleep. Here is the recommended technique: Close the eyes and cover them with the palms of the hands, making sure the palms do not touch the eyes. Elbows must be supported.

Next, relax the body, attempting to observe breathing patterns, counting the breaths in cycles of 10 or trying to visualize as clearly as possible some pleasant thought.

These activities should be repeated at regular intervals until they become routine.

These exercises were provided by vision specialists Rosemary G. Gordon.

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NEW PRODUCTS

Kaypro IBM-compatible personal computer out

Kaypro Corp. of Solana Beach, Calif., has introduced an IBM-compatible personal computer as well as a personal computer starter kit.

The Kaypro PC is a desktop, Microsoft Corp. MS-DOS-based microcomputer. The heart of the system is the Intel Corp. 8088 microprocessor housed on the central processor board. The Kaypro PC also has a multifunction board that contains the floppy-disk controller, 256K bytes of memory expandable to 640K bytes, a serial port and a parallel port.

It comes with a 12-in. monochrome monitor with green phosphor display, two double-density disk drives and a locking keyboard identical to the Kaypro 2861 and the IBM Personal Computer AT.

In addition to MS-DOS 2.11, the Kaypro PC comes with a comprehensive set of applications software including Micropro International Corp.'s Wordstar, Malmmerge,

Corrector and Starindex. It costs \$1,595.

The Kaypro Starter Kit includes the Kaypro personal computer case and motherboard, complete with perpetual clock and calendar, speaker and six full-length and three half-length IBM-compatible slots.

It comes with one 350K-byte disk drive with a 5¼-in. slot for a second drive, a locking keyboard with Personal Computer AT layout and a 123W power supply that is strong enough to handle most hard disk drives.

To complete the full package, the user may add a CPU board, a multifunction board and a videoboard with monitor. The Starter Kit offers flexibility by allowing users to design a system to meet their own needs. Depending on the component selection, the user can put together a system that is compatible with the IBM Personal Computer, Personal Computer XT or AT.

The Kaypro Starter Kit costs \$595.

Lanpar adds four models to Vision II

Lanpar Technologies, Inc. of Markham, Ont., has added four new models to its Vision II line of terminals, offering a choice of Digital Equipment Corp. or Burroughs Corp. compatibility.

The Vision II-3222, priced at \$1,095, is compatible with DEC's VT220, VT100 and



A Vision II terminal

to eight logical pages of text in memory, dual setup tables that can be assigned to two respective bidirectional host ports and VT220-style keyboard.

The Vision II-3222-GFX, priced at \$1,490, is a graphics terminal. It combines full Vision II-3222 functionality with 890-by-500-pixel graphics resolution. It is compatible with Tektronix, Inc.'s 4010 and 4014. It has a Motorola, Inc. 58000 32-bit processor, up to 250 lines of display memory, graphics dump to printer and optional third port enabling the unit to be hooked up to two hosts and a printer.

The Vision II-3210 costs \$975 and features all the functionality of the Vision II-3222. It has a VT220-style keyboard, DEC VT100 and VT52 compatibility and block-mode capability.

The fourth new model is Vision II-1100: which at \$1,395, offers Burroughs ET1100 and TDS30 emulation. It has a standard numeric keypad and a screen memory expandable to 128K bytes, which it shares with 28 programmable functions. It also features an independently addressable printer port, independent group address for a printer and 1.2K bytes of nonvolatile function memory.

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Micro Control enhances Cadkey

Upgrades computer-aided design, drafting system

Micro Control Systems, Inc. of Vernon, Conn., has enhanced Cadkey, its two-dimensional and three-dimensional computer-aided design and drafting system for IBM Personal Computers, Personal Computer XT's, Personal Computer AT's and plug-in compatibles.

New features include Cadkey's Advanced Design Language (CADL) providing ASCII I/O to Cadkey via disk files, Micro Control said.

With CADL, two-dimensional drawings and three-dimensional designs generated in Cadkey can be used in other applications such as finite element analysis, spreadsheet, data base and numerical con-

trol programs, the vendor said.

Other upgrades include cross-hatching for brick, steel, copper, alloys, aluminum, rubber and marble in ANSI standard; three-dimensional mesh generation consisting of either points or lines; ability to produce mirror images of a 2-D or 3-D object; and the ability to create disk notes with an external word processor that can be read into the Cadkey system for graphic display and documentation of a drawing or model, the company said.

System requirements include 512K bytes of memory, 356 lines and 16 colors. Input can be from a tablet, mouse, function keys and keyboard.

Cadkey costs \$2,685, according to the vendor.

An optional translator, which transfers three-dimensional data bidirectionally, sells for \$750.

AT&T's SAM tool debuts

AT&T has announced Security Access Manager (SAM), a building access security system.

SAM uses an ATAT PC 6300 with hard disk, a magnetic stripe reader and ATAT frame creation system Series 360 data base and graphics system to capture, store and retrieve photographic images and clearance ratings for individuals.

SAM consists of a creation center and guard station. The creation center allows the user to create and store descriptive employee information.

When an employee inserts an identification card at a guard station, SAM establishes positive identification by accessing and displaying the employee's photo and ID information.

An entry-level SAM costs \$30,500.

Adage introduces stand-alone workstations

Adage, Inc. of Billerica, Mass., is offering a series of stand-alone graphics workstations that operate in Digital Equipment Corp. and IBM environments.

The 6500 line of workstations uses the MicroVMS operating system, combining IBM 6500 Graphics System emulation, the Adage Ocean Graphics Engine and DEC's 32-bit Microvax II microprocessor.

There are four entry-level configurations. Models 6580 and 6585 provide IBM 6500 emulation, Microvax II power and two- and three-dimensional color graphics capabilities. Models 6500 and 6505 are said to provide the same graphics capabilities, only in a DEC environment, the vendor said.

All models run MicroVMS-based software including PDA Engineering Co.'s Patran; Swanson Analysis Systems, Inc.'s Ansys; and MacNeal-

Schwendler Corp.'s MSC/Nastran.

Each workstation features multiwindowing, multiterminal capabilities and four to eight RS-232 ports that are available for additional user terminals, printers or other serial devices.

Workstations can reportedly be configured with 3M bytes to 9M bytes of VAX memory, up to 4M bytes of display list memory, from 106M bytes to 600M bytes of fixed Winchester disk drive capacity and 4- or 8-bit planes of double-buffered pixel memory.

Security includes system access by key lock, MicroVMS software protection and optional fixed-disk protection.

An entry-level 6500 workstation consists of the Ocean Graphics Engine, one 3M-byte Microvax II with floating-point hardware, eight RS-232 lines, dual 800K-byte floppy

disk, 105M-byte 4-in. fixed Winchester disk drive, Ethernet interface, 4-bit plane of double-buffered pixel memory, 1M byte of graphics memory, a 10-in. 60Hz noninterlaced color monitor and keyboard, according to Adage.

Operating software includes a MicroVMS license supporting up to eight users; the Adage Graphics Library, including Tektronix, Inc. 4100 and DEC VT220 emulators; and the Adage Window Management System.

Prices start at \$49,500 for the Model 6500 and at \$66,000 for the Model 6580.

Information appearing in the New Products section has been provided by manufacturers and has not been independently validated by Computerworld.

NEW PRODUCTS

Systems software

Landmark Systems Corp. has announced that the Monitor for CICS, a CICS performance management system, has been enhanced to provide performance statistics for non-IBM data base systems that run under CICS.

This new feature enables users to gather performance data for Software AG of North America, Inc.'s Adabas, Cullinet Software, Inc.'s IDMS, Applied Data Research Inc.'s Datascom/DB, Cincom Systems, Inc.'s Total and other vendor-supplied or in-house data base systems.

The Monitor's data base support is implemented through a user interface. Summarized performance statistics for each data base are available on-line, and the Monitor's batch reporting system supports all data base performance statistics.

The Monitor for CICS is available for a permanent site license fee of \$16,000 for MVS/XA, MVS and VSI systems and \$8,000 for DOS systems.

Landmark Systems, 6654 Lakeside Court, Springfield, Va. 22150.

Tektronix, P.O. Box 14752, Portland, Ore. 97214.

EAW Computer Systems International has announced Release 5.2 of **SYSTM**, its CICS/VS electronic mail system.

SYSTM is a menu-driven message distribution system that includes filing, electronic forms, CICS printer control, teletypewriter support, multidivision and multiprocessor support and an applications program interface.

Release 5.2 features include simplified menus and screens and a check mail address allowing users to check the "In" basket from menu screens. Print functions have been added as well as a carbon-copy feature for the "Out" basket.

Release 5.2 of SYSTM supports CICS Releases 1.6 or later and costs \$12,000 for DOS sites and \$14,000 for MVS/VS sites. Calendaring and scheduling are available for \$5,000.

EAW Computer Systems, P.O. Box 4785, Boise, Idaho, 83711.

Data General Corp. has enhanced its **DG/UX** native **AT&T Unix** system and **MV/UX** its hosted **Unix** for the 32-bit **Eclipse MV** family of superminicomputers and **Distributed Systems (DS)** workstations.

DG/UX was upgraded to support **AT&T's Unix System V Release 2 Version 2** plus 96% of the system calls from the University of California at Berkeley **Unix v.4.2**.

MV/UX, which integrates **Unix** with **AOS/VS** software, adds **AT&T Unix System V Release 2 Version 2** features — including paging, record and file locking and a security administration package.

DG/UX and **MV/UX** also support **TCP/IP**, a communications protocol that lets **DG** and **Eclipse MV** systems coexist in local-area networks con-

sisting of **DG** and non-**DG** equipment.

Typical prices are \$39,000 for an **Eclipse MV/4000 DC** with eight users; \$27,000 for a single-user **DS/4200 engineering** workstation; \$87,000 for an **Eclipse MV/4000** with eight users; \$165,000 for an **Eclipse MV/8000 II** with 16 users; and \$310,000 for an **Eclipse MV/10000** with 64 users.

DG, 6300 S. Syracuse Way, Englewood, Colo. 80111.

Productivity aids

Datamate Co. has announced three disk management utility programs for users of **NCR Corp.** 9000 series superminicomputers. **Disc-Pack**, **Copy-Wild** and **Directaid** all run under the **NCR ITR** and **IRX** operating systems.

Disc-Pack is a disk compression utility used to recover storage space lost due to disk fragmentation.

Copy-Wild allows users to specify the prefix or suffix of a file name and copy all the files that match that partial name to another disk.

Directaid creates directory listings which allow the user to sort by name, allocation, organization, creation date, starting sector or record length.

Disc-Pack costs \$495, **Copy-Wild** costs \$295, and **Directaid** costs \$95. **Datamate**, Suite 128, 4136 S. 100th East Ave., Tulsa, Okla. 74146.

Eagle Software, Inc. has released **VS Toolbox**, a set of utilities that supplements **Data General Corp.'s**

AOS/VS operating system.

VS Toolbox contains nine utilities designed to improve **DG's** **Infos** file organization system. The utilities reportedly enhance file organization, monitor system performance, improve system security and enhance **AOS/VS** file access time.

The **Inspector** utility analyzes **Infos** file organization. The **Architect** utility allows the user to recreate **Infos** files and change file characteristics. The **Rebuilder** reorganizes **Infos** files to reduce sequential processing time. The **Cross-Examiner** compares two copies of an **Infos** index and data base and reports any differences. The **Secret Agent** monitors system performance. The **Terminator** watches the system for inactive consoles. The **D. A.** examines directories to determine an optimum hash frame size and files to determine if the number of index levels could be reduced. The **Surgeon** recreates a file with the same creation time but with a different element size and fewer index levels. The **Director** utility redirects indirect records in an **Infos** file.

VS Tool box is priced at \$1,850. **Eagle Software**, P.O. Box 16, Salina, Kan. 67402.

MacKinnery Systems has announced two **CICS** aids, **Show** and **Tell** and **CICS/Swap**.

Show and **Tell** is designed for troubleshooting, security, training and documentation. It runs on **IBM** or **IBM-compatible** mainframes with

Continued on page 110

Tektronix, Inc. has expanded its line of automated **Structured Analysis (SA)** Tools to operate on the **DPC VAX** system running **VMS** as well as the **VAX** running **AT&T Unix**.

The **SA Tools** are designed to support front-end system and software modeling due to the availability of powerful graphics software, model analysis and hard-copy output.

The **SA Tools** use the **Tektronix 4100** series of color graphics terminals for interactive input. Hard-copy output uses the **Tektronix 4690** line of color graphics copiers and 4640 line of printers.

The price of **Tektronix SA Tools** for the **VAX** is \$16,500.

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Q IF DATA NETWORK MANAGEMENT IS SO IMPORTANT, HOW COME PEOPLE DON'T AGREE ON WHAT IT IS?

A. One reason is that within the telecommunications industry there isn't much agreement on what is meant by the word "network." What one company calls a network, a second company considers to be only a small portion of what it calls a network. The differences are ones of scope and scale. And they are truly significant.

Q Can you give me an example?

A. Some people might consider a data network to be a web of phone lines. But when manufacturers of modems (devices that enable computers and terminals to communicate over phone lines) talk about a network, they usually mean the phone lines plus the modems.

And when IBM talks about a data network, we mean something far more inclusive.

Q What's IBM's definition of a network?

A. First, let's look at why data networks exist. A network's purpose is to enable a person at a terminal to communicate with a host computer and other users, and thereby produce useful work.

In IBM terms, a network includes the communications capability of the host computer, the individual terminal and everything in between—regardless of whether that terminal is located in the next room, in the next state or in the next continent. And regardless of whether it's one terminal—or one thousand terminals.

So when IBM says "network management," we mean the end-to-end management of your entire IBM data network.

Q What's IBM's approach to network management?

A. We provide a system of hardware and software products that enables the network operator to "see" down the communication lines all the way to the end terminal. With this ability the operator can anticipate and correct potential network problems before they become real network problems.

And if there is a real network problem—an interruption or slowing of service—the operator can isolate and identify the specific component that is causing the problem and recommend the best way to fix it. You see, the purpose of network management is to ensure the consistent delivery of quality information to the network users.

Or, more simply stated, it's the ability to detect and correct problems rapidly, regardless of where they occur on the network.

Q Why should I even worry about network problems?

A. For many companies, when their networks slow down, their ability to do business slows down. Network availability means that

remote locations can enter customer orders, answer customer questions, check delivery schedules and just generally be productive. Your network's performance can materially affect your company's ability to compete in today's marketplace.

Q How can I tell if my company's network is operating up to snuff?

A. One barometer is response time. That's how long it takes a terminal to answer a request. Now a lot of things can affect the network's response time. How busy is the host? How complicated is your request? What communications equipment are you using between the terminal and the host?



The point is, once the end user and the telecommunications manager agree on an acceptable response time, IBM network management products have the ability to monitor the actual response times and give an early warning of service deterioration.

Another barometer is how long it takes to get a problem fixed. We found that in networks that use our approach, the vast majority of problems are immediately fixed by the network control center during the initial phone call for help. Now, we'll be quick to add that when a tornado in Kansas tears out a lot of phone lines, that's a major problem. But most network problems aren't caused by tornadoes. They're caused by little things like a loose wall plug or the fact that someone forgot how to log on to the system.

Q Is there a limit to how large a network the IBM products can manage?

A. Not really. We use our products to manage our own network of over 30,000 terminals and printers scattered all across the country. From one site we can determine the physical location and operating condition of every piece of equipment.

In addition, when your company adopts the IBM approach of end-to-end network management, you'll be able to tell from your network control center if the problem is a loose wall plug in San Francisco, a noisy line in Boston or a tornado in Kansas.

Q Is this pie in the sky? Or are these products available now?

A. The IBM network management hardware and software are available now, and they're designed to grow with your company. In fact, this network management capability is already built into much of the IBM hardware you currently have.

Q Why should I adopt IBM's approach to network management?

A. Because only IBM can offer you an end-to-end solution. Our hardware and software will enable your company to manage your data network from the host computer all the way to the very last IBM terminal.

Perhaps the best way to get an understanding of IBM's approach to network management is to visit an actual installation. If you'd like to do that, talk to your IBM marketing representative.

And if you would like to read more about IBM's approach to network management, send for the free brochure, "Building a network is an ongoing job."

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NEW PRODUCTS

Continued from page 108

CICS, running DOS; OS or MVS. It has four major functions. The Show function displays what is currently on another CICS terminal.

The Spy function monitors another terminal's transactions. The Tell function echoes a series of transactions run on a master terminal on other terminals or printers. A copy of each screen can be printed for reference or documentation. The Maps function will display a map into which data may be entered.

CICS/Swap is a CICS session-handling aid. It allows users to swap back and forth between two CICS transactions, making changes on either.

Show and Tell is priced at \$695. An annual lease costs \$295. CICS/Swap is priced at \$695 for MVS systems and \$495 for DOS systems. Annual leases are \$395 for MVS and \$295 for DOS.

MacKinney Systems, Suite 112, 2674-A South Glenside, Springfield, Mo. 65804.

IBM Software, Inc. has announced 3270 Optimizer/VM, a new VM system software product designed to reduce network loads and improve response time on remote IBM 3270 terminals in a VM network.

The product uses data stream optimization to reduce the number of characters needed to transmit a message to 3270 screens.

The 3270 Optimizer/VM is available until Jan. 1 for a perpetual license fee on the first CPU of \$9,750. After Jan. 1, the cost will be \$12,500.

IBM Software, P.O. Box 2092, Sugarland, Texas 77478.

Scott-Kennard & Associates, Inc. has introduced a CICS support package, Transaction Documentation Processor (Help), designed to offer on-line documentation to transaction developers and users.

Accessed by keying in Help on the users transaction screen, the package provides a documentation menu containing seven areas, such as a general description of the transaction, a description of the functions of the transaction and a description of the product from which the transaction arises.

Components of the package include an on-line full page editor that provides for the customized addition and deletion of data and the maintenance of existing data, a print program for producing hard copy and a batch data base load program for ASCII files.

Users of IBM's Copes manufacturing software can

purchase on-line documentation for its bill of materials, inventory accounting, material requirements planning, shop order release and product cost calculation.

The system is written in Cobol and requires CICS and DL/I.

The base price is \$16,500 and may range up to \$30,000, depending on the system components selected.

Scott-Kennard & Associates, P.O. Box 1048, Morgan Hill, Calif. 95037.

Integrated Software Systems Corp. (ISSCO) has announced Cuechart Chartbook Library, a software package of more than 750 pre-designed charts for producing computer graphics for presentations.

Cuechart Chartbook Library, an option to Iasco's Tell-A-Graf package, consists of three sets of chart books.

The Management Chartbook provides 300 formats for applications such as management, budget and sales, as

well as reporting experimental or production run data.

Comparison Chartbook provides about 200 formats including strip and group charts and row and column displays. Applications include product performance by branch or region and display of experimental results against predictions.

Word Chartbook provides approximately 250 formats for presenting lists of words. Formats include multiple column, tabular comparison

lists and bullet.

The Cuechart Chartbook Library will be available Nov. 15 for IBM MVS and CMS and Digital Equipment Corp. VAX/VMS. The prices until Dec. 13 range between \$450 and \$6,200, depending on the computer system configuration. After Dec. 13, prices will range between \$600 and \$8,200, the vendor said.

ISSCO, 10505 Sorrento Valley Road, San Diego, Calif. 92121.

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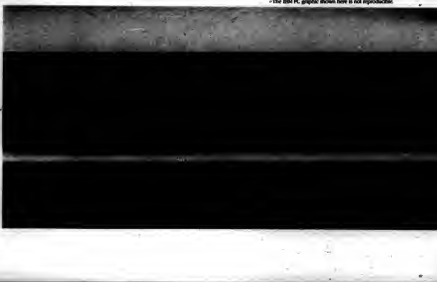
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Datagraphix

The Computer Output Management Company
A General Dynamics subsidiary

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NEW PRODUCTS

Rand Systems Corp. has announced Performance Utilization Plus (PUP), a software package said to maintain a minimum of 70% CPU use for the IBM System/38 during peak hours of operation.

The product will periodically extract information from the System/38 to determine the adjustments necessary to maintain peak efficiency, according to the vendor.

The program is available

for \$650.

Rand Systems, Suite 305,
7071 Orchard Lake Road, W.
Bloomfield, Mich. 48033.

Financial Dynamics, Inc. has announced programming utilities for Dbase III and Turbo Pascal.

Dbase III utilities consist of a menu system, data maintenance and archival routines plus dynamic Help routines.

Pascal utilities include a menu-generation system that allows programmers to create menus similar to Lotus Development Corp.'s 1-2-3 with submenus, a descriptive message line and context-sensitive Help.

Among the other 45 Pascal utilities are date math, time math and formatting routines similar to Dbase picture formats.

String and numeric routines, such as case conversion, string conversion, five

text trim functions plus Dbase II and III direct file access, are also supplied.

The utility packages, each priced at \$40.95, operate on computers that run Dbase III or Turbo Pascal, the vendor said.

Financial Dynamics, P.O. Box 108968, Arlington, Va. 22210.

Application packages

J. L. Ham & Associates, Inc. has unveiled a Fixed As-

set Control One System version for the IBM System/38.

Fixed Asset Control One System is a menu-driven tax planning program. It supports the Tax Reform Act of 1984, and it allows for the processing of multiple companies or entities. It is used to produce depreciation schedules and other reports.

Data entry is all on-line, and there is an on-line inquiry facility allowing users to review the status of assets or accounts without printing the schedules.

Fixed Asset Control One System for the IBM System/38 costs \$2,500.

J. L. Ham & Associates, Maple Professional Building, 683 Maple St., Plymouth, Mich. 48170.

Westinghouse Electric Corp. has announced an on-line personal and resource scheduling calendar enhancement to Mailtronic, its electronic mail system.

The new feature is said to enable users to schedule meetings and the use of physical resources such as conference rooms. The scheduling system allows a user to request a meeting. It then updates the personal calendars of the attendees and checks for conflicts. In the case of a conflict, alternative dates, times and locations are suggested.

Mailtronic operates as an application under the Westinghouse's West teleprocessing system or as a task under IBM CICS. Versions are available for IBM operating systems DOS/VSE or OS/MVS. Files are maintained through VSAM.

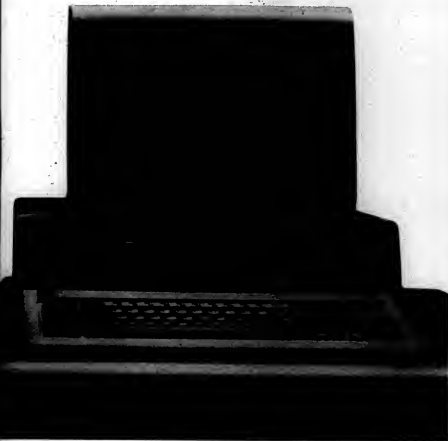
The cost of Mailtronic is \$9,000 for VSE systems and \$16,000 for MVS systems.

Westinghouse Electric, Building 7, Penn Center, Pittsburgh, Pa. 15235.

MAD Systems, Inc. has upgraded its Myra Myra business and manufacturing software to provide one-stage or two-stage billing, Canadian sales tax calculations

Continued on page 112

Recorders reduce computer ease.



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Continued from page 111

and recapitulations and immediate print invoices for point-of-sale transactions.

Other Myte Myke Version 3 enhancements include recurring order handling for standing orders, back orders placed during order entry or prior to billing, 26 additional user-defined fields of customer information and sales commission based on price or profit. Version 3 also includes blanket orders for individual promise dates per

line item and daily shipment planning report.

Written in RM Cobol, the software runs on systems including IBM Personal Computers, Personal Computer XTs, ATs and compatible computers; IBM System/360; Teleview Systems, Inc. Personal Minicomputers; and AT&T 3B2s.

Myte Myke costs between \$796 and \$1,496, depending on the hardware and operating system, according to the vendor.

MAD Systems, P.O. Box 106, 3885 N. Buffalo Road, Orchard Park, N.Y. 14127.

EVB Software Engineering, Inc. has released a 22,000 line object-oriented design application called **Complexity Metrics Tool (CMT)** for Ada software that consists of more than 700 pages of documentation, source-code listings and a user reference manual.

The Ada source code consists of 256 separate compilation units that are direct representations of the design process, according to the vendor.

Prices are \$2,789 for the first site and \$499 for each additional site.

EVB Software Engineering, Suite 100, 451 Hungerford Drive, Rockville, Md. 20850.

Westmoreland Systems, Inc. has enhanced its **3D-Doc** data dictionary documentation system for the IBM System/34 and System/36.

The latest version of 3D-Doc adds security for fields and files, more room for comments plus edit codes and headings for interfacing with the firm's ADD system. ADD is the Application Design & Development system that creates report program generator source code automatically for reports, inquiries, on-line maintenance and batch programs.

3D-Doc costs \$750.

Westmoreland Systems, Suite 1, 228 Park Ave. N., Winter Park, Fla. 32790.

Languages

Berwell-Packard Corp. has announced **HP Business Basic/3000**, an implementation of a Basic language for the HP 3000 business computer.

HP Business Basic/3000 is designed to simplify program development for the HP 3000. It features both an interpreter and a compiler accessible through Basic commands and statements. In the interpretive environment, developers can get immediate feedback on the effect of program modifications and on syntax errors as program lines are entered.

HP Business Basic/3000 comes with an extended feature set including statements and constructs to support structured programming. The language also includes support for long identifier names and alphanumeric labels. Seven data types are provided, and numeric data can be packed into strings. HP Business Basic/3000 provides the ability to call user-supplied routines written in Pascal and system intrinsics. HP Business Basic/3000 is compatible with the HP MPE

Continued on page 113

THE DAWN OF COMPATIBLE COMMUNICATIONS

FutureCom™ In Brief Introducing the FutureCom 2000 Integrated Area Network™ and the end of compatibility and connectivity problems in networking.

Now you can combine local and wide area networks into a single unified system. FutureCom is the innovation you've been waiting for—the best features of both local and wide area networking in one powerful package.

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The FutureCom LS2000 Local Server provides access for computer or terminal devices to an Ethernet LAN for efficient local resource sharing. The RS2000 Remote Server provides wide area connectivity via multiple RS-232C composite links (up to 4 per node). Both servers support up to 32 channels and provide local and remote switching, port contention and advanced security features.

FutureCom Integration The key to the Integrated Area Network is the NS2000 Network Server, a bridge between Ethernet and RS-232. The NS2000 consists of one Ethernet link and up to four RS-232 links. Use it to connect multiple

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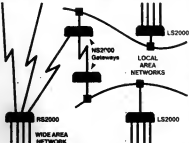
understands the implications of a network that cannot be changed and improved upon. FutureCom is designed for continuous growth and diversification, and will grow with you to keep your network in tune with your needs. Modular hardware and software design assures flexibility and adaptability, and additional channel capacity can be added in the field.

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a FutureCom Network. Call us toll-free (800) 235-6935 in the Continental U.S., or in California (800) 368-8092 and ask for a free FutureCom brochure. ComDesign, Inc. 751 South Kellogg Avenue, Goleta, California 93117. (805) 964-9852. TWX 910-334-1189.

ComDesign

Leaders in Data Communications



*RS25 and other networking capabilities are currently under development.

NEW PRODUCTS

Continued from page 112

operating system, allowing users access to MPE capabilities. Call compatibility is also maintained with other MPE languages such as Cobol and HP Fortran.

The product also allows users of HP 250 and HP 260 multiuser systems to convert programs and files to the HP 3000 environment.

HP Business Basic/3000 is priced at \$5,500, including documentation and utilities for converting HP Basic/250, HP Basic/260 and HP Basic/3000 to HP Business Basic/3000.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

AT&T Information Systems has announced Advanced Computer Techniques Corp.'s compiler products for the AT&T SB series of computers. AT&T Integrated Compiler Products are programming languages designed to generate efficient object code while sharing a common code generator and common routine libraries.

The languages offered are Command Cobol, Command Fortran, Command Pascal, Command Basic as well as a Common Integrated Runtime Symbolic Debugger. All four compilers conform to the most current language standards and are fully integrated with the C language and the AT&T Unix System V environment.

They use a common Unix file format, allow cross-calling between languages and use native operating system services to enhance the

efficiency of the compilers and their generated application programs.

Command Basic and the debugger each cost \$1,000 for the SB2 computer and \$2,000 for the SB6. Command Fortran and Command Pascal each cost \$1,200 for the SB2 and \$2,500 for the SB6. Command Cobol costs \$2,500 for the SB2 and \$6,000 for the SB6.

AT&T Information Systems, 200 Southgate Pkwy., Morristown, N.J. 07920.

Amalgamated Software of North America, Inc. is offering an RPG-III compiler for System 6364, IBM's desktop System/36.

The RPG-III compiler provides structured programming constructions including DO, DO-WHILE, DO-

UNTIL, IF-THEN-ELSE, COMPARE-AND-BRANCH and CASE operations. These facilities eliminate indicator usage in Calc specifications, the vendor claimed.

Advanced disk file operations supported by the compiler include READ, PREVIOUS, OPEN, CLOSE and UPDAT. I/O operations are READ, SETGT, EXFMT and WRITE.

In addition, the RPG-III supports externally defined fields, data areas and indicators as fields and arrays, the vendor said.

Language features are upwardly compatible with the System/38. Programs compiled in RPG-III can run on systems not using the product, according to the vendor.

A one-time license fee costs \$750.

Amalgamated Software of North America, P.O. Box 6610, Malibu, Calif. 90264.

Intel Corp. will market C-Line/C-English, a fourth-generation programming language that generates C programs for its System 300 microcomputers, including the 286/310 supermicrocomputer.

With a syntax similar to Ashton-Tate's dBase III, C-Line/C-English acts as a front end to resident C compilers, enabling programmers with no knowledge of C to generate C programs, a spokesman claimed.

C-Line/C-English has been available for a year from its developer, O Line, Inc., for DOS and IBM PC-DOS-based personal computers and intelligent workstations. The software is now offered under both Microsoft Corp.'s Xenix 286 and DOS.

The package costs \$1,695 for Intel 286/310 systems.

Intel, 2402 W. Beardsley Road, Phoenix, Ariz. 85027.



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Virginia and Canada, call
1-703-860-5050.)

01/1988

NEW PRODUCTS

Remote computing services

General Electric Information Services Co. (GEISCO) is offering Surenet Returns Service, an automated clearinghouse for returns and notifications of change processing for financial institutions.

Surenet Returns Service provides automated clearinghouse returns processing for commercial entries and federal recurring payments such as Social Security or veterans' benefits payments.

Automated clearinghouse returns processing involves returning entries transmitted through the automated clearinghouse, such as payroll deposits, for such reasons as incorrect account numbers or the death of the beneficiary.

Software that operates on IBM Personal Computers, Personal Com-

puter XT's or compatible microcomputers provides for key entry and transmission of automated clearinghouse returns and notifications of change.

The software costs \$25 per package, the vendor said. A Hayes Microcomputer Products, Inc.-compatible modem and an 80-col. printer is also required.

GEISCO delivers submitted entries to the Federal Reserve System for distribution back to the originator. Charges are 50 cents for each return, 20 cents for each notification of change plus an initial setup charge of \$30.

The service supplies initial copies of daily reconciliation and monthly activity reports for free.

GEISCO, Payment Services Operation, 401 N. Washington St., Rockville, Md. 20850.

Training

DB View, Inc. has announced that a three-day, on-site training course is now available to aid users of DB2, IBM's relational data base system, in performance monitoring and tuning.

The course offers instruction on data collection, interpretation and performance tuning using DB2 accounting information. The on-site course includes a one-day workshop to evaluate and improve DB2 performance at the user site.

The course costs \$2,000. DB View, 314 Beacon St., Boston, Mass. 02116.

Boeing Computer Services Co. has announced Scholar/Teach microcomputer Version 3 and Schol-

ar/Teach mainframe Version 5.4, enhanced releases of its Scholar/Teach computer-based training system for IBM and compatible processors.

Both versions now offer a menu-driven screen development editor that eliminates the need for command statements. Users can build course screens that combine text, input fields, highlighting, color and keyboard graphics by using menus plus cursor and function keys.

The enhanced microcomputer system also includes an expanded color graphics editor and an interface with video display technology.

A video interface used with interconnected microcomputer and video equipment lets authors develop multimedia courseware that allows students to view video demonstrations of experienced users working with equipment.

An additional upgrade to the mainframe system is a menu designed for novice or occasional course developers that prompts the user with available course development alternatives.

Scholar/Teach microcomputer Version 3 operates on the IBM Personal Computer or Personal Computer XT under IBM PC-DOS with at least 128K bytes of memory. Licenses cost \$495 for Author plus Presentation versions and \$95 for Presentation systems only.

Priced at \$35,000, the mainframe Version 5.4 runs on IBM mainframes. Boeing Computer Services, 7980 Gallows Court, Vienna, Va. 22180.

Software

Zsoft Corp. has released Version 3 of PC Paintbrush, its drawing package for IBM Personal Computers.

Version 3 of PC Paintbrush has 16 new features, including rubber band circles, automatic curve drawing, rounded boxes and variable font stroke widths. PC Paintbrush has adjustable palettes and Lotus Development Corp.'s 1-2-3 Pic file interpreter. It is now possible to edit pictures that are larger than the screen and to edit the entire screen void of menus.

PC Paintbrush requires a minimum of 320K bytes of memory. Version 3 costs \$139. PC Paintbrush is also available bundled with several digitizers like Kurta Corp.'s wireless pen mouse.

Zsoft, Suite A-466, 1950 Spectrum Circle, Marietta, Ga. 30067.

Computer Associates International, Inc.'s Micro Products Division has released an enhanced version of Supercalc3A for Apple Computer, Inc.'s Apple IIc and enhanced Apple IIe computers with at least one disk drive.

The version supports Apple's Unidisk 5.5 disk drive, the Apple II Memory Expansion Card and the Imagewriter II color dot matrix printer.

Unidisk's 394-in. disks contain 800K bytes of memory, making it possible to put the Supercalc3A program and all utilities on a single disk. The Memory Expansion Card provides up to 1M byte of random-access memory, allowing users of Supercalc3A to use up to 512K bytes of memory. The Imagewriter II printer

Continued on page 117

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NEW PRODUCTS

Continued from page 116

allows users to convert SuperCalc3A's screen displays to color hard copy.

SuperCalc3A is priced at \$196. Computer Associates International, 2196 Fortune Drive, San Jose, Calif. 95131.

Software Publishing Corp. has announced new versions of PFS:File, PFS:Report, PFS:Write, PFS:Plan and PFS:Graph for Apple Computer, Inc.'s Apple IIc and IIc computers.

The versions will support Apple's Prodos operating system, a Unidisk 3.5 disk drive, a Profile hard disk, the Apple II Memory Expansion Card, the Imagewriter II printer and the Colormonitor IIc and Iie.

The Prodos versions of the PFS software series will be available in November for \$125 each. A utility program to convert data files created with the non-Prodos versions of PFS software into Prodos format is available at no charge.

Software Publishing, 1901 Landings Drive, Mountain View, Calif. 94043.

Megahaus Corp. has unveiled Reportworks, an addition to its Megaworks mail-merge and spelling checker program for Apple Computer, Inc.'s Apple II computers.

Reportworks enables users to import data from Apple's Applesoftworks data base and spreadsheet files to create and print reports, tables, lists and forms.

Reportworks supports the Apple II Memory Expansion Card and Apple's Unidisk 3.5 disk drive.

It costs \$125. Megahaus, 5703 Oberlin Drive, San Diego, Calif. 92121.

Quark, Inc. released Version 3 of its Catalyst program selector for Apple Computer, Inc.'s Apple IIc and the enhanced 128K-byte Apple IIc.

Version 3 features include an interface similar to that of the Macintosh computer and desk accessories like a calculator. It supports Apple's Unidisk 3.5 disk drive and Profile hard disk and the Quark QC10 and QC20 hard disks.

The cost of Catalyst 3 is \$149. Upgrades are available for \$45.

Quark, Suite 220, 2525 W. Evans, Denver, Colo. 80219.

United Software Industries, Inc. has released a new version of its ASCII Express telecommunications software package for Apple Computer, Inc.'s Apple IIc and IIc computers.

The version runs under Apple's Prodos operating system, supports Apple's Unidisk 3.5 disk drive and Colormonitor Iie and Iic. It is compatible with the Apple Personal Modem as well as direct-connect applications. ASCII Express costs \$129.95.

United Software Industries, Suite 300, 1880 Century Park E., Los Angeles, Calif. 90067.

Fischer Innis Systems Corp. has released Watchdog 4, a new version of its software-based security pack-

age for the IBM Personal Computer XT, AT and Personal Computer compatibles with hard disks.

New security features include a system of permissions to control the scope of user activity and encryption keys that activate automatic scrambling and unscrambling of protected files and programs. New file management features include an expanded number of protected directories and on-line Help screens.

Watchdog 4 costs \$295. Fischer Innis Systems, 4175 Merchandise Ave., Naples, Fla. 33942.

Broderbund Software, Inc. has announced that its two graphics software packages for the Apple Computer, Inc.'s Apple II computer series, Dazzle Draw and Fantavision, will

support Apple's new peripherals.

Dazzle Draw will work with the Colormonitor Iie and Iic, the Imagewriter II printer and the Unidisk 3.5 disk drive. Fantavision will run on the Colormonitor Iie and Iic.

Dazzle Draw is priced at \$59.95. Fantavision is priced at \$49.95. Broderbund Software, 17 Paul Drive, San Rafael, Calif. 94903.

Orange Micro, Inc. has released a revision of its Serial Grappler printer interface for Apple Computer, Inc.'s Apple II computer series.

The version supports the Apple Imagewriter and Scribe printers. The Serial Grappler still supports the Imagewriter I. It costs \$119.

Orange Micro, 1400 Lakeview Ave., Anaheim, Calif. 92807.

Individual Software, Inc. has introduced the Individual Training for Phase III training program for users of Ashton-Tate's Phase III.

Individual Training for Phase III features interactive lessons designed to involve users in data base models.

The program is available for the IBM Personal Computer, Personal Computer XT, AT and PCjr and compatibles having a minimum of 128K bytes of memory and DOS Version 2 and up. The price is \$49.95.

Individual Software, 1163-C Chess Drive, Foster City, Calif. 94404.

Perelman/Calamus has released Direct Mail Manager, a direct mail software package for small- and medium-size mail order operations.

Continued on page 118

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DATA PROCESSING	NETWORKING	OFFICE AUTOMATION
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NEW PRODUCTS

Continued from page 117

Direct Mail Manager prints packing slips, invoices, packing lists and shipping labels. It tracks customer buying patterns and inventory movement and generates shipping and payment reports.

The system costs \$1,495. Perelman/Calmas, P.O. Box 241768, Los Angeles, Calif. 90024.

Viewlogic Systems, Inc. has unveiled **Workview 700**, a personal computer-aided engineering (CAE) package that reportedly lets users perform analog and digital designs from one multiwindow user interface.

The software, which runs on IBM, and compatible per-

sonal computers under DOS, combines into one system the Workview 100 entry-level package, Workview 300 digital design software and Workview 500 analog design program.

Workview 700 features include schematic entry; a waveform processor; document processing that merges text and graphics; Edit interface, including net list, schematics and symbol conversion files; and communications facilities for email and file transfer among mainframes, superminis, personal computers and other engineering workstations.

A hierarchical menu structure is said to provide browse ahead and look back functions. Journaling lets users retrace their steps in the

event of a system crash, the vendor said.

Workview 700 requires at least 512K bytes of random-access memory and a monochrome screen. It supports many standard graphics boards and an optical mouse. Available options include plotting, interfaces to CAE/computer-aided design systems and simulation on superminicomputers.

Prices range from \$6,500 to \$13,900, depending on whether document processing is included.

Viewlogic Systems, 33 Boston Post Road West, Marlboro, Mass. 01752.

GT National Corp. has added **Membership Manager** to its Target/1 line of fund-raising and membership software for nonprofit organizations. The microcomputer software is said to combine data base, accounting and word processing functions to assist with membership development programs.

The package tracks 99 membership levels, allows for multiple membership purchases by a member, generates up to four renewal notices and sorts and selects members by 100 criteria, according to the vendor.

Accounting features reportedly include flexible billings, aging reports, receivables reports and a daily financial journal. The software supports organizations using cash, accrual or fund accounting methods.

Priced at \$1,500, **Membership Manager** runs on most Microsoft Corp. MS-DOS and Digital Research, Inc. CP/M-86 microcomputers including IBM Personal Computers XT and AT, Digital Equipment Corp. Rainbows, Wang Laboratories, Inc. Professional Computers, Texas Instruments, Inc. Professional Computers and NEC Corp. NEC-APC III. It requires 128K bytes of random-access memory, hard-disk storage and a 132-col printer.

GT National, P.O. Box 3008, 400 Center St., Auburn, Maine 04210.

Stillwell Software Products is offering **Freefile**, a relational data base program for the IBM Personal Computer.

Menu-driven **Freefile** lets users import data from other programs and, in turn, export data base information to other applications such as spreadsheets. Data is selectable using relational operators.

Freefile also supports computed fields that are similar to formulas in a spreadsheet. This capability lets users define fields in which values are derived from values in other fields.

A companion program, **Re-**

build, is also available for recovering data lost when exiting **Freefile** abnormally.

A single copy of the program costs \$45 and includes a printed manual and Rebuild. Users can buy the program and the documentation without vendor support for \$10.

Stillwell Software Products, 16408 N. 43rd Drive, Glendale, Ariz. 85306.

Successware, Inc. has unveiled a marketing software package called **Marketing Edge** for IBM Personal Computers and compatibles that has 17 applications as well as presentation graphics.

Designed to work with Lotus Development Corp.'s 1-2-3, **Marketing Edge** includes tools for sizing market opportunities, determining target customer needs, analyzing competition, defining product requirements, making profit and loss projections and tracking project milestones.

Marketing Edge comes in two volumes: Volume 1 is **Market Analysis**, and Volume 2 is **Market Implementation**. Each volume sells individually for \$195. When purchased together, the cost is \$325.

Successware, P.O. Box 5007, 203 Annandale Drive, Cary, N.C. 27511.

Two RM/Cobol business packages, **Bill of Material Processor** and **Customer Order Processing**, are available from **MCBA, Inc.**

Both packages provide user-defined function keys, printer and file I/O error messages plus the ability to store programs and multiple sets of data files on any disk or directory for sharing among companies.

Each package runs under IBM's PC-DOS or Microsoft Corp.'s MS-DOS on the IBM Personal Computer XT, Wang Laboratories, Inc. Professional Computer and Texas Instruments, Inc. Professional Computer. Prices range from \$900 to \$1,500.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

A co-resident on-line Help system, called **DOS Helper**, for DOS that can substitute for the DOS Reference Manual is available from **Aristo Software Co.**

The program provides Help files for each DOS and Debug command. Besides supplied files, users can add their own Help files, the vendor says.

The package includes two versions. A co-resident version loads into memory and can be accessed from other applications, and a standard version must be invoked from the DOS prompt.

DOS Helper operates on the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatible processors running DOS 2 or higher. Other requirements are an 80-column by 25-row color, monochrome or black-and-white display; one disk drive; and at least 128K bytes of memory.

The software costs \$29. Aristo Software, Suite 213, 16811 El Camino Real, Houston, Texas 77068.

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NEW PRODUCTS

The Software Link, Inc. has released Version 3.03 of its Multilink Advanced, software that lets users connect up to eight dumb terminals to a single computer in a multiuser multitasking environment running IBM's PC-DOS, according to the vendor.

The software reportedly supports PC-DOS 3.1; provides file and record locking, databases that expand available memory to more than 640K bytes, the 8087/80287 co-processor and user-definable

automation of the disk-based print spooler.

Up to 3M bytes can be used to store documents in the printer queue, the vendor said.

In addition, users can re-define the host computer's Multilink keys, the Alternate and Function key combinations.

Release 3.02 is available for \$496.

The Software Link, Suite 632, 8601 Dunwoody Place, Atlanta, Ga. 30338.

Haba Systems, Inc. has announced Habacalc, a mouse- and menu-driven spreadsheet for the Apple Computer, Inc.'s Apple II. Habacalc supports a maximum 64-column by 256-row spreadsheet size and provides 45K bytes of memory for calculations.

Other features include pull-down menus; cut, copy and paste edit commands; scroll bars and specialized mathematical functions such as averages and square roots.

In addition, users can create bar and pie graphs automatically from spreadsheets.

Habacalc costs \$74.95. Haba Systems, 6711 Valjean Ave., Van Nuys, Calif. 91406.

Anex Technology, Inc. and Softbeam, Inc. will jointly market Doctor DOS, a utility program that increases the operating speeds of Intel Corp. 8086-based IBM Per-

sonal Computers and compatible personal computers two to five times by replacing or enhancing system calls within the operating system.

Doctor DOS replaces the portion of PC-DOS and MS-DOS that handles character I/O, doubling screen response time. Nondisk related system calls are also replaced, yielding speed increases of up to five times.

In addition, Doctor DOS increases the size of the keyboard buffer from 15 to 160 characters, alleviating problems associated with fast typing and bar code reading. It costs \$49.95.

Anex Technology, 151 North Rt. 9W, Congers, N.Y. 10920.

Haba Systems, Inc. has announced a software series called Solutions for the Apple Computer, Inc. Macintosh. The series provides six applications for the Macintosh: Business Forms, Business Letters, Wills, Checkminder, Windowdialer and Quickfinder.

Designed for use with Macintosh word processors, Business Forms and Business Letters let users create and print customized business documents and personalized business correspondence. Data can be entered while forms appear on the screen or filled in after blank documents are printed. Business Forms offers 40 predesigned forms in seven categories. Business Letters reportedly provides 50 prewritten letter and memo formats.

Users can select different type fonts, styles and sizes. Each letter file includes page setup, letter content, rules for letter writing and capability for mail merge applications. Wills uses 14 legally prepared documents to allow married and single individuals to write their own wills or update existing documents with a codicil form.

The personal money management program, Checkminder, is said to maintain multiple checking accounts and offer automatic check-writing, depositing, reconciling and tax-deductible expense reporting.

Windowdialer dials telephone numbers from a window containing up to 200 names and numbers.

Quickfinder lets users bypass the Macintosh desktop menu to move from one program to another.

This utility works with Switcher and with 128K-byte or 512K-byte Macintosh models.

Prices are \$49.95 for Business Forms, Business Letters, Wills and Checkminder and \$29.95 for Windowdialer and Quickfinder.

Haba Systems, 6711 Valjean Ave., Van Nuys, Calif. 91406.

Continued on page 120

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NEW PRODUCTS

From page 119

Software

Syntaxics Corp. has announced an enhancement to its Crystalwriter word processing program, Crystalwriter Plus, for AT&T's 386, 386 and Unix PC 7300 computers.

Crystalwriter Plus includes text merge capabilities, a records editor, an object-based footnoting procedure plus a spelling checker and corrector.

The text merge module, Crystalmerge, merges variable text into form letters, preprinted forms and other documents. The records editor lets users create and edit lists produced by relational data bases that can then be integrated into mass mailings using Crystalmerge.

Object-based footnoting automatically numbers and positions footnotes on the correct page, even in in-

stances when the reference moves.

Crystalspell, the spelling checker, uses a dictionary of more than 80,000 words to check documents for spelling errors and suggest correct spellings.

Other enhancements include decimal tabs for creating tables of numbers for documents that require statistical typing, model document selection that provides a directory of fully formatted model documents and forms, and directory management for accessing the file directory from within Crystalwriter Plus.

Prices are \$895 for the 386, \$1,795 for the 386 and \$475 for the PC 7300. Existing Crystalwriter users can upgrade to Crystalwriter Plus for \$100 on the 386 or 386 and for \$80 on the PC 7300.

Syntaxics, Suite 145, 3333 Bowers Ave., Santa Clara, Calif. 95061.

Programming Concepts, Inc. has upgraded Clist, a package that provides hard-copy printouts and cross-references for programs written in C.

Version 2 adds the ability to calculate and print metrics and statistics for analyzing programming projects, according to the vendor.

Priced at \$129 for a single CPU license, Clist will operate under IBM's PC-DOS 1.1 or higher.

Programming Concepts, 2150 Smithtown Ave., Ronkonkoma, N.Y. 11779.

Hayden Software Co. is offering Macbase, a relational data base program for the Apple Computer, Inc. Macintosh.

The software uses icons and pull-down menus for designing data base

forms. Data types can be alphanumeric, integer, floating point, telephone data and calculations. Items in one form can be related to other forms, allowing multiple views of data and cross-updating of files.

Macbase costs \$195, and works with a minimum of 512K bytes of memory.

Hayden Software, 600 Suffolk St., Lowell, Mass. 01850.

Sheppard Software Co. has unveiled Microport 1, a project management system for IBM Personal Computers, Personal Computer XT's and AT's and compatible processors.

Microport 1 schedules time, produces time-scaled network diagrams and summarizes resource use or costs across projects. A full screen editor displays up to 24 activities at once.

Microport 1 can produce data interchange format files through which project data can be communicated to other software packages. The project management system can also produce Gantt charts, cost or resource histograms and eight standard reports.

Priced at \$350, Microport 1 requires IBM's PC-DOS 2 or higher, 256K bytes of memory and two disk drives. A demonstration disk is available for \$25.

Sheppard Software, 4750 Clough Creek Road, Redding, Calif. 96002.

Affiliated Service Bureaus, Inc. is offering the What-If Amortization Schedule for users of Microsoft Corp. Basic.

The software package generates amortization schedules based on alternative payment methods such as applying an additional amount to the principal when each payment is made; making payments weekly, bi-weekly, semi-monthly or any other nonmonthly schedule; and paying enough to cover the next payment's principal amount. All reports on full or partial schedules can be printed.

The What-If Amortization Schedule lets users enter legal alternative payment scheme information as economic conditions require different uses of cash flow. The package can also be used to enter loan criteria under consideration to test the effects on overall payment requirements.

The software costs \$19.95.

Affiliated Service Bureaus, Software Products by Lewis Division, Box 239, R.R. #3, Marshalltown, Iowa 50158.

Systems

Vector Automation, Inc. has announced three IBM Personal Computer-based auxiliary workstations, the XT-511 Basic Workstation, the Mod-

Continued on page 128



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European agents: Software Engineering Branch Inc., The Netherlands. Telex 84431117; Thorn EMI Computer Software, U.K. Telex 851858015.

INFODATA®

NEW PRODUCTS

Continued from page 120

el XT-512 Advanced Workstation and the Model AT-513 Advanced Workstation, as options to its Cadmax series of computer-aided design and manufacturing systems.

The XT-511 Basic Workstation is an IBM Personal Computer XT with 256K bytes of memory, a 360K-byte floppy disk, a 10M-byte fixed disk plus monochrome adapter and display.

Model XT-512 Advanced Workstation is an IBM Personal Computer XT with 512K bytes of storage, a 360K-byte floppy disk, a 10M-byte fixed disk, enhanced color graphics adapter and display and the Intel Corp. 8087 math chip.

The AT-513 Advanced Workstation is an IBM Personal Computer AT with 512K bytes of memory, a 1.2M-byte floppy disk, a 20M-byte fixed disk, enhanced color graphics adapter and display plus the Intel 80287 math chip.

With Cadmax communications, the workstations range in price from \$5,300 to \$9,600.

Vector Automation, Village of Cross Keys, Baltimore, Md. 21210.

Communications

American High-Tech Industries, Inc. has unwrapped Magnum MCS-A, an asynchronous multifunction communications system that provides asynchronous emulation capability through a character translation mechanism for the IBM Personal Computer, Personal Computer XT, AT and compatible computers.

The system is said to use a password handshake protocol with Turbocom, the vendor's communications software, to offer security protection for transferring files between an unattended central personal computer and other local or remote units.

Magnum MCS-A provides the capability to emulate Digital Equipment Corp. VT52 and VT100, IBM 3101-MOD 10/20 and Data General Corp. Dasher 210/211 terminals.

The system is available in two forms: a unit with an AT&T 212A modem, serial port, parallel port, mouse and game port, clock/calendar and support software, costing \$495; and a unit with those features plus 64K bytes of memory expandable to 512K bytes and software to create an electronic random-access memory disk, costing \$1,195.

American High-Tech Industries, Suite 201, Eleven One Eleven Wilcrest Green Drive, Houston, Texas 77042.

Eicon Technology Corp. is offering networking products, Network Adapter, Attach/X.25 and Access/X.25, for integrating the IBM Personal Computer, Personal Computer XT, AT and PC Network with X.25 packet networks.

Network Adapter is an intelligent communications card consisting of a Motorola, Inc. MC68008 microprocessor, 128K bytes of random-access memory, four direct memory access channels and two serial communications ports.

Designed to connect IBM and compatible personal computers to packet-switched networks, Network Adapter also provides an RS-232C interface port that supports full-duplex data transmission at up to 64K bit/sec.; a second port is said to offer

full compatibility with Apple Computer, Inc.'s Apple Talk.

Attach/X.25 and Access/X.25 support the CCITT X.25 recommendation and integrate packet assembly/disassembly facilities (PAD) directly within the micro. Up to 32 virtual circuits can be maintained concurrently with combined throughput of more than 75 packet/sec., a spokesman said.

Attach/X.25 lets users access a remote Personal Computer.

Access/X.25 supports the standard X.3/X.28/X.29 interface for asynchronous start-stop terminals on public data networks. The software lets users define required PAD parameters and optional network administration user facilities.

When used with the Network Adapter, Attach/X.25 and Access/X.25 are said to provide access to GTE Telenet Communications Corp.'s

Telenet, McDonnell Douglas Network Systems, Inc.'s Tymnet and AT&T's Accunet packet service.

Attach/X.25, including the Network Adapter, costs \$1,195 for a single-user version and \$1,395 for a multiuser version. Similar Access/X.25 configurations cost \$995 and \$1,195, respectively.

Eicon Technology, 3452 Ashby St., Montreal, Canada H4R 2C1.

Storage

CMS, Inc. has announced Perfect 120, a 120M-byte hard disk subsystem for the IBM Personal Computer AT and Compaq Computer Corp. Deskpro 586.

The Perfect 120 has a 30-msec access speed with a 5M byte/sec. transfer rate. The cost is \$7,395.

CMS, 401-B W. Dyer Road, Santa

Ana, Calif. 92707.

Priam Corp. has added a 5¼-in. add-in Winchester disk drive to its InnerSpace line and cut replacement drive prices between 15% and 20%.

Geared for the IBM Personal Computer and Personal Computer XT without disk controllers, the InnerSpace drive offers 43M-byte or 60M-byte capacities with a data access speed of 30 msec.

It costs \$1,995 for the 43M-byte ID40-PC and \$2,295 for the 60M-byte ID60-PC. In addition, Personal Computer XT and AT drive prices were reduced 15% to \$1,695 for 43M-byte capacity drives and 20% to \$1,995 for 60M-byte drives.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134.



NEW PRODUCTS

Printer/Plotters/
Peripherals

Roland DG has released the CD-340, a 12-in. monitor for the IBM Personal Computer and compatibles.

The CD-340 monitor features 720 by 400-pixel resolution, a 0.31mm dot pitch, 25-kHz scan frequency and a black matrix screen.

The unit costs \$799.

Roland DG, 7200 Dominion Circle, Los Angeles, Calif. 90040.

Sakata U.S.A. Corp. has introduced the SP-5500 printer for micros that contains a built-in parallel Centronics Data Computer Corp. interface and an optional serial interface.

The SP-5500 printer is said to print up to 136 pica columns on spreadsheet-width paper. The unit comes with either a 3K-byte input data buffer or 256 user-defined characters and prints at 180 char./sec. at a 60-dba noise level. It costs \$699.

Sakata U.S.A., 651 Bonnie Lane, Elk Grove Village, Ill. 60007.

Citizen America Corp. has announced the 120D, a dot matrix printer that operates at 120 char./sec.

The 120D features switch-selectable IBM and Epson America, Inc. compatibility. It offers a correspondence-quality mode operating at 25 char./sec. The printer has graphics capability, a 4K-byte memory buffer, variable-width tractor feed and bottom and rear paper feed. The 120D costs \$249.

Citizen America, 2425 Colorado Ave., Santa Monica, Calif. 90404.

Citizen America Corp. has announced the Premiere 35, a letter-quality daisy-wheel printer.

The Premiere 35 reportedly prints 35 char./sec. and has an operating noise level of 55db. It features an 8K-byte user-available buffer and a built-in switch-selectable Diablo Systems, Inc. 630, NEC Corp. 3560 and Qume Corp. Sprint 11+ compatibility. It uses Diablo 630-compatible print wheels and ribbons. It costs \$599.

Citizen America, 2425 Colorado Ave., Santa Monica, Calif. 90404.

NEC Home Electronics, Inc. has introduced four 12-in. monochrome monitors, the JB-1270MA, JB-1275MA, JB-1280DA and JB-1285DA.

Two are directly compatible with the Apple Computer, Inc. Apple IIc, Apple IIe and Apple III and the IBM PCjr.

The JB-1270MA model has a green phosphor display and the JB-1275MA has an amber phosphor display.

The other two are for the IBM Personal Computer, Personal Computer AT and compatibles equipped with a monochrome display/printer adapter card. The JB-1280DA has a green phosphor display and the JB-1285DA has an amber phosphor display.

The JB-1270MA and the JB-1275MA cost \$179.

The JB-1280DA and the JB-1285DA cost \$199.

NEC, Suite 10, 700 Nicholas Blvd., Elk Grove, Ill. 60007.

The **Torrington Co.** has introduced **Manager Mouse**, a mouse designed with an independent suspension system and a self-contained drive mechanism.

Manager Mouse plugs directly into any IBM Personal

Computer, Personal Computer XT, AT, Compaq Computer Corp. Compaq Portable, Plus and Deskpro and other compatibles with a standard RS-232C interface. It comes with TMouse software.

The **Manager Mouse** costs \$198.

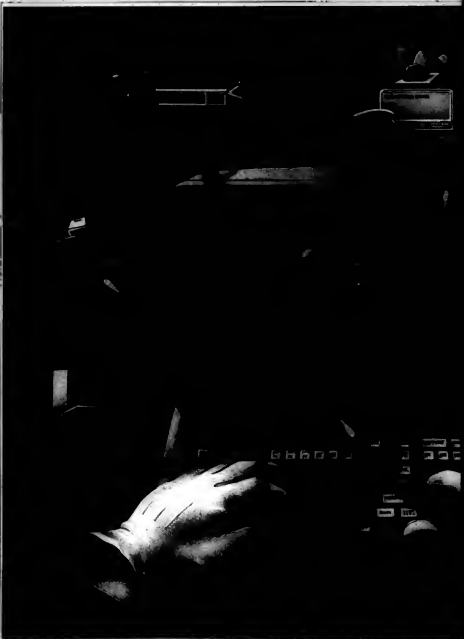
Torrington, 58 Field St., Torrington, Conn. 06790.

Epson America, Inc. has added **Epson DX-35**, a wide-

carriage printer, to its line of daisy-wheel printers.

The Epson DX-35 prints 35 char./sec. Standard features include friction paper feed, a Diablo Systems, Inc.-compatible interchangeable daisy-wheel, 3K-byte print buffer and a Diablo all-purpose interface that allows compatibility with the IBM Personal Computer, Personal Computer XT, AT and the Apple Computer, Inc. Apple II.

The DX-35 offers variable



NEW PRODUCTS

character pitch with 10, 12 and 18 char./in. plus a proportional spacing mode.

The DX-25 costs \$899. Epson America, 2780 Leimata Blvd., Torrance, Calif., 90507.

Controllers

Backus Data Systems, Inc. has expanded its automatic callback computer se-

curity system with Dialsafe 18, which supports a maximum of 18 computer ports.

Dialsafe 18 includes a security directory that can accommodate 500 user IDs, passwords and telephone listings. Residing between the dial-up modem and the host computer, Dialsafe 18 asks callers for an ID and password. Callers are called back and must supply the ID and password again before connected to the host.

The 18-line computer se-

curity system costs \$9,000.

Backus Data Systems, Suite 110, 1440 Koll Circle, San Jose, Calif. 95112.

Advanced Computer Communications Co. has introduced the ACP 5260, a single-board Motorola front-end communications processor with on-board X.25 firmware.

The ACP 5260 is a Motorola, Inc. MC68000-based in-

telligent front-end processor for Digital Equipment Corp. Unibus and Q-bus computers that can connect public and private packet-switched networks.

The ACP 5260 offers two levels of networking capability, basic mode and extended mode, which support up to 128 switched or permanent virtual circuits at speeds up to 64K bit/sec.

Basic mode comes with 128K bytes of memory and standard network default ca-

pacity. Extended mode raises memory to 512K bytes, boosts frame and packet sizes to 1,024 bytes and adds extended sequence numbering.

Single-quantity prices are \$5,299 for the basic mode ACP 5260 and \$5,899 for the extended-mode version.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101.

Protocol Converters

Network Software Associates, Inc. has announced Adapt-SNA LU6.2, a communications package for IBM Personal Computers and compatibles designed to implement IBM's LU-type 6.2 (LU6.2) protocol.

Adapt-SNA LU6.2 allows the Personal Computer to communicate and transfer files as an LU6.2 device in an IBM Systems Network Architecture/Synchronous Data Link Control network.

It can be used for both Personal Computer-to-mainframe and Personal Computer-to-Personal Computer applications.

It is available as a complete software/hardware package for \$1,690 or as a software-only product for \$795.

Network Software Associates, 22982 Mill Creek, Laguna Hills, Calif. 92653.

Software

Communications Research Group, Inc. has announced Vaxblast, an addition to its line of Blast communications software products.

Vaxblast is a file transfer utility for Digital Equipment Corp.'s VAX computers, designed to combine asynchronous file transfer with virtual terminal connections among VAXs, remote personal computers and other computers running Blast software.

Blast allows the VAX to initiate and control file transfers and remote functions. Blast's terminal mode allows users to log on and work interactively on unattended remote systems or to transfer files to other computers. Vaxblast requires RS-232 ports and dial-up phones.

It costs \$895. Communications Research Group, 8939 Jefferson Highway, Baton Rouge, La. 70809.

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N.M.T.C.—Alcove D • COMDEX FALL—Booth 2366

Simware, Inc. has released an enhanced version of Sim3278/PC.

Sim3278/PC, with Sim3278 running on a host mainframe, is a communications program offering IBM users a micro-to-mainframe link without the requirement for additional hardware or

Continued on page 129

A real-world lesson in using a computer as a marketing tool.

Here's how it's done at WTC Air Freight. With the all-important help of a Sperry MAPPER® System.

WTC is a major worldwide freight forwarder. And in that tough competitive environment, large contracts can be won or lost on seemingly small vendor differences. For WTC's primary customer target, traffic management, control of goods in transit ranks high on the list.

So WTC developed a MAPPER-based computer system that gives the company a competitive edge by giving the traffic manager total information and control. Right at his own PC or terminal.

With just a few simple English-language commands, a traffic manager can get tracking information just about any way he wants it. A P.O. number is all he needs to get instant information on the

status of any shipment, anywhere in the world. He can even pull one item out of a shipment and have it rushed to a new destination.

And a lot more. Right at his own PC or terminal.

What it all comes down to is a powerful marketing advantage for WTC.

Where competitors' systems require learning obscure computer codes, the MAPPER System uses plain English. In terms of user convenience, it's no contest.

MAPPER made development of the system a lot easier, too. With COBOL programming, it would have taken 60 man-months. With MAPPER, the job was done in just 12 man-months.

And because of the inherent simplicity of MAPPER language, non-DP management people were able to test and modify the system all through the development pro-

cess. So they got precisely what they needed, instead of someone else's approximation.

The fact is, MAPPER's simplicity makes it a powerful tool for any task, any business. With the MAPPER System, ideas become computer solutions in astonishingly short order.

Seeing is believing. Come to a nearby Sperry Productivity Center and see MAPPER in action. Or, next best, look over our MAPPER literature. Call us toll-free: 800-547-8362, ext. 101.

Or write: Sperry Corporation, Box 500, Blue Bell, PA 19424-0024.

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NEW PRODUCTS

Continued from page 127

add-on boards. It also provides users of IBM Personal Computers, Personal Computer XT's and compatibles with full-function 3278 Model 2 emulation.

Slim3278/PC Version 2 includes features such as Digital Equipment Corp.'s VT100 terminal emulation, support for the Xmodem protocol and increased DOS command functionality.

Slim3278/PC is priced at \$250 for a single copy, \$195 per copy for two to nine copies and \$165 per copy for 10 or more copies. Corporate licenses are priced at \$7,500 per mainframe.

Sinware, 14 Concourse Gate, Nepean, Ont. K2E 7S6.

Multiplexers/Modems

Anchor Automation, Inc. has announced a 1,200 bit/sec. modem, the Signalman Secure 12, with a built-in security callback system designed for applications where users at remote locations access information.

Signalman Secure 12 ensures security through a password callback procedure in which a remote user at a terminal equipped with a standard modem calls the Secure 12 and inputs a password. The Secure 12 disconnects the line, verifies the password against a stored list and, if the password is valid, automatically calls the telephone number it has associated with the password.

The system stores an average of 64 password and callback combinations in 1.2K bytes of memory. Security levels are configured by the user. A secondary password is offered in addition to the primary password. The security features can be bypassed, enabling the Secure 12 to operate as a standard Signalman Express modem.

The cost of Secure 12 is \$499. Anchor Automation, 6913 Vanjaan Ave., Van Nuys, Calif., 91406.

Keene Corp.'s Versitron Division has announced Versimux, a fiber-optic multiplexer.

Versimux can reportedly multiplex up to 60 voices or 120 data channels on fiber-optic lines that can be up to 3 kilometers apart. It is plug compatible with a number of standard interfaces. The multiplexer operates in a 14-port high-speed mode, with transmission speeds up to 76.8K bit/sec., or a 30-port low-speed mode, with speeds up to 38.4K bit/sec.

A Versimux unit consists of one master multiplexer card and 14 port modules. Each port module is configured to be plug compatible with a particular interface and to support the required control signals.

Versimux systems range in price from \$3,280 to \$25,575.

Versitron, 6310 Chillum Place N.W., Washington, D.C. 20011.

Datatel, Inc. has introduced the DCP9050, a six-channel time division multiplexer that operates at speeds from 9.6K to 64K bit/sec.

The DCP9050 works with telephone lines and AT&T's Dataphone Digital Service. Input channel speeds are switch-selectable from 2,400 to 19.2K bit/sec. Link speeds can operate at 9.6K, 14.4K, 19.2K or 56K bit/sec. The product employs bit interleaving time division multiplexer techniques.

DCP9050 can use products that incorporate RS-232, RS-422 and CCITT V.25 interfaces.

The multiplexer costs \$2,150. An optional Channel Service Unit/Data Service Unit is available for \$500, and a kit for installing the product in a 19-in. rack sells for \$100.

Datatel, Cherry Hill Industrial Center, Cherry Hill, N.J. 08008.

Lightcom, Inc. has unwrapped the LC 100 universal data multiplexer for use with IBM 3270 and asynchronous RS-232C devices.

The LC 100 consists of fiber-optic cables connecting at both ends to modular rack-mounted universal data multiplexer units that interface to computers and terminals. There are up to eight, interface

modules supporting a maximum of 16 ports each.

Designed to link installations that are up to 2 kilometers apart, the LC 100 allows the coaxial transmission schemes of the IBM 3270 and RS-232C asynchronous start/stop to operate concurrently over the same optical fiber.

The system is compatible with the IBM Cabling System and transparent to a user's attached systems.

Point-to-point configurations reportedly allow two LC 100 units to connect with both ends in channel-to-channel correspondence using dual-fiber cables. Multipoint loops have clusters of terminals at different locations.

The LC 100 costs \$3,000 per average single-end configuration.

Lightcom, 3853 Breakwater Ave., Hayward, Calif. 94545.

Network Products, Inc. has announced Localmux, a local-area multiplexer that allows users to run up to eight terminals on one set of twisted-pair cables and operates for distances up to two miles.

Localmux combines a multiplexer and a short-hand modem. Terminal speeds can reach 19.2K bit/sec. asynchronous or 38.4K bit/sec. synchronous. Data is communicated directly at full speed with no flow control interposed.

Localmux works with mainframes and personal computers from Digital Equipment Corp., Hewlett-Packard Co., Prime Computer, Inc., Tandem Computers, Inc. and IBM.

A Localmux unit is priced at \$995.

Network Products, 4020 Stirrup Creek Drive, Research Triangle Park, N.C. 27709.

When Control Data demanded Total Performance, Zenith delivered.

Total performance. For Control Data Corporation—inventor of Cyber 205, the world's most powerful "Supersystem"—it's the only option.



So, when Control Data needed a microcomputer to aid in the manufacture of the Cyber 205, they chose the one that delivers nothing less than "total performance"—the Zenith Z-150 PC. After all, it takes a super computer to help make a "Supersystem".

Today, hundreds of other corporations and universities throughout the country have also chosen Zenith. Why? Because all Z-300 PCs are IBM PC-compatible. But even more importantly, they come equipped with enhanced features that go beyond mere IBM PC compatibility, including greater internal expandability. Storage that can expand to 11 megabytes. A detailed feature list is available on request.

All IBM PC-compatible features and more. For your free brochure, call 1-800-421-1000. Zenith Data Systems Corporation, 10000 West Higgins Road, Roseville, IL 60018.



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NEW PRODUCTS

SYSTEMS
AND PERIPHERALS

Data Storage

Point 4 Data Corp. has added an 86M-byte 5¼-in. Winchester disk drive for the entry-level Mark 2 computer system.

The disk is said to double the capacity of the Mark 2, which supports up to seven concurrent users.

There is a field upgrade program for existing Mark 2 installations. The 86M-byte disk lists for \$4,600.

Point 4 Data, 2550 McCabe Way, Irvine, Calif. 92714.

Terminals

Tandem Computers, Inc. has added three ergonomic terminals — Models 6636, 6636 and 6637 — to its 6530 series.

The new models offer all the functionality of the current 6630 models. In addition, they have low-profile keyboards and meet European ergonomic requirements. Features include support options such as a local printer, voice input and bar code and magnetic stripe readers.

Model 6636 has a 15-in. diagonal screen. Model 6636 has a 12-in. diagonal screen, and Model 6637 has a 9-in. diagonal screen. Prices are \$2,176, \$1,976 and \$1,826, respectively. Limited quantities will be available next month. Production quantities will be available in January 1986.

Tandem Computers, 10191 Valico Pkwy., Cupertino, Calif. 95014.

The ED-1900 series of 12- to 20-in. monochrome video displays that offer 40-MHz bandwidth is available from Sierra Scientific.

The ED-1200 series provides 100 ppi/in. resolution, 60db signal-to-noise ratio and 1% combined distortion and nonlinearity.

The monitors hold picture size change under 1% for combinations of picture brightness, scan rate and power line voltage. All models operate from either 110V or 220V ac power, consume less than 90W and include P4 phosphor as standard, according to Sierra Scientific.

Prices range from \$3,450 to \$4,770, depending on CRT size and enclosure style.

Sierra Scientific, 1173 Borregas Ave., Sunnyvale, Calif. 94089.

Printers/Plotters

Printonix, Inc. has announced its 4160 Graphic Printer that works in conjunction with Spicor Computer Development, Inc. Canguaph software as an output device for all Cadam, Inc.'s Cadam applications.

The 4160 is said to operate in either print or plot mode on paper or mylar. Plot time is approximately 40 seconds for A-size drawings and 75 seconds for B-size drawings with a maximum width of 13¼ in. Hard copy is routed by IBM print utilities through IBM 3274, 3270 or 3705 controllers. The cost is \$13,700 for the printer, software and interface.

Printonix, P.O. Box 19559, 17500 Cartwright Road, Irvine, Calif. 92713.

Canon U.S.A., Inc. has released a Group III laser facsimile, FAX-L910, which was designed to deliver ultra-high resolution on plain paper.

The FAX-L910 consists of a digital scanner, an intelligent controller and a laser beam printer with a replaceable cartridge system. It reportedly features a built-in electronic phone directory and dialer with 20 memory keys, 30-page automatic document feeder and programmable time.

Over an ordinary phone line, FAX-L910 is said to have a transmission speed of 9.6K bit/sec. It offers three resolution settings, up to 406 by 391 picture elements per inch and can be used as a plain paper copier.

It is available now at a cost of \$6,495.

Canon U.S.A., One Canon Plaza, Lake Success, N.Y. 11042.

Facit, Inc. has announced Opus 1, a laser printer for use with both parallel and serial RS-232C interfaces.

Opus 1 is said to have a print resolution of 90,000 dot/in. and to print at a rate of 12 page/min. It can emulate the Facit 4555, the Diablo Systems, Inc. Diablo 630, and Qume Corp. daisy-wheel printers.

Opus 1 offers eight-directional line-drawing capabilities in five line widths. It has a memory for up to four forms that can be stored for use with text overlay.

The cost is \$9,500, according to the vendor.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

Talaris Systems, Inc. has announced a desktop laser printer, the Talaris 810, designed as a daisy-wheel and dot matrix replacement.

The Talaris 810 is an eight page/min, 300 dot/in. resolution laser printer said to function as either a single-user or a network printer. It features Diablo Systems, Inc.'s 630 ECI; Qume Corp.'s Sprint; Epson America, Inc.'s FX-80; and ANSI 3.64 printer emulation modes. It supports Microsystems Engineering Corp.'s MASS-11 word processing system, the American Mathematical Society's Tex computer typesetting system, Epson FX-80 bit-map graphics and ANSI line and box drawing and raster bit-map commands.

The printer uses a Canon U.S.A., Inc. LBP-CX print engine and a Motorola, Inc. 68000-based controller. Total bit-map memory for Epson FX-80 and ANSI raster plotting is 128K bytes. Down-line-loaded font and overlay storage is 80K bytes of dynamic random-access memory, permitting up to five fonts to be loaded at a time.

The Talaris 810 attaches to Digital Equipment Corp. VAX/VMS and AT&T Unix-based systems and workstations as well as IBM Personal Computers via an RS-232 asynchronous serial port using Xon/Xoff protocol or on a Centronics Data Computer parallel interface.

The Talaris 810 is priced at \$3,950.

Talaris Systems, P.O. Box 261580, 6160 Carroll Canyon Road, San Diego, Calif. 92126.

Continued on page 131

CMS* eliminates expensive coaxial cable in any 3270 or compatible system!



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For more information call (800) 242-4723, or write General Technology Inc., 415 Plasco Ct., Melrose, P.A. 02948. Dealer/master inquiries invited.



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NEW PRODUCTS

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Printers/Plotters

Cado Systems Corp. has released four printers, the P-1008, P-1008, P-2001 and the P-4001, for its Tiger ATS line of multiuser computer systems.

The P-1008 and P-1008 daisywheel printers are said to provide letter-quality printing. The P-1008 prints at up to 90 char./sec. and the P-1008 prints at 45 char./sec.

The P-2001 and P-4001 are dot matrix printers. The P-2001 prints draft-quality documents at 288 char./sec., correspondence-quality at 192 char./sec. and letter-quality at 96 char./sec. The P-4001 prints draft-quality documents at 180 char./sec. and near-letter-quality documents at 85 char./sec.

The P-1008 and P-1008 cost \$2,455 and \$1,575, respectively. The P-2001 and P-4001 cost \$2,085 and \$630, respectively.

Cado Systems, P.O. Box 3758, 2056 W. 190th St., Torrance, Calif. 90510.

Addressograph Farrington, Inc. (AFI) has announced its 3100 Direct Impression (DI) printer designed to print directly onto different-size mailable media.

The AFI 3100 DI produces dot matrix print impressions at a rate of 80 char./sec. It can generate six lines of 40-char. text in standard or bold sizes or up to six lines of 20-char. text in the enlarged size. It is a 40-cpi printer at 12 char./in. and a 20-cpi printer at 6 char./in. It can handle forms with a minimum width of 4.5 in. and a minimum length of 4.125 in.

The AFI 3100 DI has built-in test functions and material-feed on-line controls. It interfaces directly to an AFI microprocessor using AFI Mail 5 or AFI Mail 6 software or to other mainframe or personal computers via a Centronics Data Computer Corp. parallel interface or an optional RS-232 serial interface. It costs \$2,650.

Addressograph Farrington, Randolph Industrial Park, Randolph, Mass. 02368.

plotting speeds of 14 in./sec., an eight-pen turret with automatic pen capping and full-width plotting capability.

The integrated communications interface allows plotter compatibility with all computer-aided design systems including IBM PC-DOS, Microsoft Corp. MS-DOS, Digital Research, Inc. CP/M-based systems. It permits the 1040GT plotters to operate on-line in a local or remote environment. The 1040GT

plotters are compatible with RS-232, RS-449 and IEEE 488 interfaces.

Model 1040GT costs \$11,900, Model 1049GT costs \$8,905 and Model 1044GT costs \$13,900. Existing 1040 plotters can be upgraded with the Plot Manager for \$1,905. Plot Manager for the 1070 series costs \$1,995, and existing 1070 plotters can be upgraded for \$2,995.

Calcomp, 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Image Atlanta, Inc. has announced Grayline Imaging System, an Intel Corp. 8088-based digital image display and output system for medical imaging, satellite remote sensing, meteorological imaging, sonar, wide-looking radar and facsimile output. The unit is said to acquire, gray-scale digitize, display, store and output video and laser hard-copy images from any standard RS-170 and RS-330 video source including videotape recorders.

The system also can receive and output digital display data either on site with a host or at remote locations through networked communications, according to the vendor.

Digital inputs come from the host computer through an IEEE 48 bus. Once the video frames are digitally stored, the Grayline Imaging System can display up to four 256-gray-scale images on its 612-by-480-pixel monitor.

Continued on page 132



Introducing the TI 880 AT Printer. Because you need a multi-user printer that works overtime.

The last thing you need is the wrong printer. A printer that quits when your work is nonstop. Or one that burns out from overwork.

Let's say you have a typical multi-user environment or a local area network. It includes IBM Personal Computer ATs, PCXTs or compatibles. What you need now is a printer that can handle your system's entire workload. A printer you can trust your business to.

You need a high-speed printer

that's software compatible with PC industry standards and capable of sustaining 300cps. It should have straight paper paths to eliminate jams; changeable fonts and enhanced print modes to take care of draft, correspondence and graphics. Its design should be rugged, durable and as reliable as you've come to expect from TI printers.

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CPIA85-12-7

Calcomp, Inc. has announced enhancements for its 1040 series of cut-sheet and dual-mode pen plotters. The 1040GT series will include three plotter models and come standard with the Plot Manager firmware.

Plot Manager organizes plot data to minimize pen movements and pen changes.

Model 1040GT and 1044GT plotters operate in both cut-sheet and roll-feed modes. Model 1045GT operates in cut-sheet mode only. The 1040GT series features

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NEW PRODUCTS

Continued from page 131
chrome screen.

A digital laser printer is said to produce a 128-gray-scale high resolution. Output media require no wet chemical processing. Cassette-loadable dry silver paper and transparency film are available in 300- and 300-ft rolls.

A basic unit, which includes a server system, printer and acquisition station for one scanner, sells for \$49,500.

Image Atlanta, P.O. Box 249, 1176 Old Ellis Road, Roswell, Ga. 30077.

Graphics systems

Verasat, Inc., a Xerox Corp. company, has announced an enhanced simulation capability for its Expert Engineer computer-aided engineering workstation.

Expert Engineer is a design automation system said to offer logic design aids such as expert schematics and expert design description language, libraries describing transistor-transistor logic, emitter-coupled logic and metallic oxide semiconductor components as well as microprocessors and multiviewer interfacing to other workstations and host computers.

The Expert Engineer's enhanced simulation capability reportedly provides increased logic simulation. The simulator is now driven directly from the schematic's in-core data structures, and it provides unit-delay and assigned-delay simulation.

According to the company, all workstations offer high-resolution density, local disk storage, display window management, optical mouse pointing device and full keyboard with function keys and Ethernet network capability.

The Expert Engineer workstation is available in configurations that range in price from \$11,695 for a monochrome workstation to \$55,000 for a full-featured color workstation.

Verasat, 2710 Walsh Ave., Santa Clara, Calif. 95051.

A Tektronix, Inc. graphics-compatible 2020-4230 that provides 1,280- by 1,024-pixel resolution for two-dimensional graphics applications is available from Ramtek Corp.

The unbundled display controller is said to run Ramtek graphics with Digital Equipment Corp. VT100 alphanumeric or can be configured to run Graphics Kernel System and Tektronix-compatible graphics including computer-aided design and manufacturing and mapping applications.

In its basic configuration, the controller can display four colors simultaneously from a 16.7 million-color palette. Optional memory pro-

vides up to 256 colors. The 2020-4230 can drive a 30Hz interlaced or 60Hz noninterlaced display, according to the vendor.

Options include an RS-232C serial host interface for asynchronous communications up to 19.2K bit/sec. Optional parallel host interfaces for direct memory access communications are available for DEC VAX and Microvax, Control Data Corp.'s Cyber, Apollo Computer, Inc. and Perkin-Elmer

Corp. computers and the IBM Personal Computer AT.

Priced from \$4,995, the controller contains a single Motorola, Inc. MC 68010-based motherboard that is said to perform internal processing at 12 MHz. The Ramtek graphics instruction set is supplied as firmware on programmable read-only memory devices, the vendor said.

Ramtek, 2211 Lawson Lane, Santa Clara, Calif. 95050.

Chancellor Computer Corp. has unwrapped the STL-ONE, a stand-alone computer-aided engineering workstation that uses the AT&T PC 6300 to create integrated circuit and printed-circuit board designs.

STL-ONE performs schematic capture and physical layout in one graphics editor, the vendor said.

The workstation is said to provide layering capacity up to 50 layers, a menu-driven, two-letter mnemonic com-

mand structure and libraries containing as many as 5,400 parts.

Priced at less than \$10,000, the STL-ONE comes with 640K bytes of random-access memory, a 10M-byte hard disk, 800K and 800T math co-processors, 640- by 400-pixel graphics interface and 16 colors from a palette of 4,096.

Chancellor Computer, 1101 San Antonio Road, Mountain View, Calif. 94043.



TI announces the portable sales tool for General Electric Plastics' field communications.

Instant access with their technical data base and 24-hour communications with headquarters. That's what the SILENT 707 Model 707 with its easy access module means to GE Company's Plastics Sales Division. Regardless of time zones and sheer distance from the home office, GE Senior Sales Representative Ray Forester can get the latest product data and cost analysis information he needs to prepare for and close a sale. All he needs is his TI 707 portable data terminal and a telephone.

"With the terminal, I can tap into GE Plastics' data base. When ERIS (Engineering Reserve Information System) is accessed by my TI 707, I can provide a customer with technical information and product specifications on the spot and leave him with a printout to review."

"The terminal also acts as my message center when I'm in the field. I

transfer messages through the GE Crenfile (electronic mail), and the individuals receive them in written form when they pick up their messages. They seem to respond more promptly with accurate, hard copy in front of them. And since I can receive messages anytime, anywhere, the TI 707 all but eliminates 'telephone tag.'"

Ray Forester believes that the TI 707 is ideal for the salesman on the go. It's lightweight and rugged, takes up approximately one half of a briefcase, and is quiet even at peak operation. "It's exactly the productivity tool we needed for our division's field communications," he concludes.

Find out about the Model 707 SILENT 707 Portable Data Terminal from TI and how it can solve your communications problems. Call 1-800-527-1500, ext. 707; in Canada, 416-884-9181. For more information write TI, P.O. Box 809063, Dept. DTB 1930W, Dallas, Texas 75380-9063.

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COMPUTER INDUSTRY



INDUSTRY INSIGHT
Clinton Wicker
For Senior Writer

Opinions on slump abound

The computer industry slowdown weighed heavily on everyone's mind at the sixth annual Alex Brown & Sons, Inc. Computer Services Seminar held in Baltimore earlier this month.

While the extent of the computer slump in the industry are the subject of debate, most chief executives speaking to the financial community found it necessary to address the issue, even if their particular firm continues to be successful. It's not surprising that one's opinion on the existence of a software slump depends heavily on what's going on at the bottom line.

Management Science America, Inc. (MSA) President William Graves, for example, said the decline in capital spending has sharply cut into MSA's IBM applications software sales. "Our sales to the oil and high-tech industries are just not making it," he said. "The economy is very hard at this time."

Graves said part of MSA's strategy to reverse its current series of losses is a new focus on "full-solution contracts" with its Information Expert line, particularly in vertical markets such as manufacturing, health care and the legislative/public sector. "Eighty percent of the software running today is old and archaic," Graves said. "We're providing the tools for people to change that."

VM Software, Inc. Chairman Robert E. Cook spoke of his firm's growth in the "exploding" IBM VM-based applications market, but he candidly noted, "If we weren't \$800,000 and 19 people below last year's expense level, we'd be in trouble. We don't see a slowdown in the VM arena, but we're watching expenses carefully."

Continued on page 144

Mostek closing doors

Victim of depressed prices, foreign competition

By Clinton Wicker

HARTFORD, Conn. — The U.S. semiconductor industry's latest battle against depressed prices and Japanese competition claimed its largest victim recently when United Technologies Corp. announced the closing of its Mostek Corp. chip making subsidiary.

The closing will eventually affect 3,200 workers at Mostek's Carrington, Texas, headquarters, which was temporarily shut down Oct. 18. A handful of employees were expected to return to work today for a "phased-down period" of undetermined length, according to a United Technologies spokesman.

The Mostek closing placed in sharp focus the fate of U.S. chip makers in the memory chip market, in which overcapacity, commodity pricing and alleged Japanese dumping, or selling below cost, have

made 1985 a year of losses and layoffs. While most leading vendors are running in the red, Mostek is the first major firm to shut its doors.

"The one-product companies are in dire straits," industry analyst Jack Beedle said of Mostek's concentration in the memory chip sector. "When prices were high, they did very well, but they aren't high anymore. Most of the other big companies, like [National Semiconductor Corp. and Texas Instruments, Inc.] are more broad based."

Beedle, president of In-Stat, Inc., a market research firm in Scottsdale, Ariz., said even Japanese firms have abandoned the low-end memory market. "There are no more 64K [random-access memory chips] in production," he said. "There are enough in inventory to supply the world for now."

Mostek had been in severe financial

Continued on page 143

Third-quarter results released

Stratus profits nearly double, Compaq posts 50% revenue increase

By Clinton Wicker

Stratus Computer, Inc. and Compaq Computer Corp. were among the big winners in third-quarter results announced recently. Finding the right growth niches during a down year for the industry, Stratus and Compaq reported significant gains over their year-earlier period results.

Stratus, the No. 2 maker of fault-tolerant systems, nearly doubled its profits from \$1.21 million, or 6 cents per share, to \$2.25 million, or 12 cents per share. The 1984 figure did not include a \$300,000 tax credit. Sales jumped 90% from \$11.1 million to \$21.1 million.

Compaq, king of the hill in the crowded IBM-compatible microcomputer market, reported earnings of \$6.3 million, or 43

Continued on page 141

Earnings at Honeywell, Burroughs down despite slight revenue increase

By Clinton Wicker

Evidence of the lingering slowdown in computer hardware continued to surface in the third-quarter results of several leading systems vendors, most of which followed a pattern set by IBM's lackluster performance during the period [CQ, Oct. 21].

Like Big Blue, both Honeywell, Inc. and Burroughs Corp. reported single-figure revenue increases but declines in earnings from continuing operations compared with the third quarter of 1984. Burroughs, hit harder than its competitors by a significant loss in its Memorex, Inc. peripherals business, saw profits sag 35.9% from the year-earlier quarter. Burroughs Chairman W. Michael Blumenthal called the Detroit

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INSIDE

CW's legal issues series concludes with a discussion of the regulation of software acquisition by the federal government **138**

A Spanish firm pleaded guilty to illegally diverting semiconductor production and test equipment to the Soviet bloc **138**

INSTANT ANALYSIS

"No one has reached maturity in automation, no matter what he claims. We are a far cry from becoming a mature industry."

— Francis B. Rodgers
Former IBM
marketing director

MCI moves closer to SBS buyout

By Bryan Wilkins

WASHINGTON, D.C. — IBM and MCI Communications Corp. said recently that they signed a definitive agreement whereby MCI will acquire virtually all of Satellite Business Systems (SBS) assets in exchange for approximately 46.7 million shares, or 16.6% of MCI common stock.

The initial agreement in principle, which was announced June 25, called for IBM to acquire 45 million shares of MCI stock plus warrants for an additional seven million shares priced at \$15 a share. However, MCI said it eliminated the warrant option in return for increasing the number of shares it will issue to IBM. The value of the transaction, based on MCI's stock price at the time of the agreement, is approximately \$357 million and did not change as a result of the elimination of the warrants.

Continued on page 139

Out of money, Denelcor seeks buyer

By Moore McEnaney

AURORA, Colo. — Unable to gain a foothold in the narrow supercomputer market, Denelcor, Inc. has closed its facilities in Aurora and is actively seeking a buyer.

Telephones at the company went unanswered last week. "They ran out of money two months ago," said analyst Robert Brodeur of the firm Pemberton, Houston, Wiloughby, Inc. in Vancouver, B.C. The company has reportedly not paid its 300 employees since July.

Denelcor manufactured a brand of supercomputer known as the Heterogeneous Element Processor, or HEP-1. The product sold for about \$2 million and was capable of processing up to 10 million instructions per second (Mips) by putting together 16 10-Mips units, Brown noted.

Sold to military installations

Several HEP-1s were sold to U.S. military installations, including facilities at the Pentagon and Los Alamos Laboratories in New Mexico. Maintenance

contracts for several of those machines have been picked up by Denvers, Inc., a maintenance company in Denver.

Denelcor was also in the process of developing a HEP-2 machine, said to be capable of processing 12,000 Mips, Brown said.

The majority of Denelcor's financial backing came from a group of British investors, according to Brown. "The investors in the UK were supporting them up to a point, then, I believe, the investors realized the company needed two years and 20 million more dollars" before it could support the second project, he said.

Denelcor board member King Shwayder told Computerworld that the company had been struggling for more than a year and could not compete with supercomputer manufacturer Cray Research, Inc. Shwayder said President David Miller opted against filing for protection under Chapter 11 of the Federal Bankruptcy Act. "He felt it would eliminate any values remaining for the shareholders," Shwayder said.

COMPUTER INDUSTRY

Regulation determines government use of software

NINTH IN A SERIES

By Jerome A. Roberts
and Michael P. Brewster
Special to CW

Specific sections of the Federal Acquisition Regulation govern federal government software acquisition. Failure to comply with the regulation may enable the government to receive very broad usage rights regarding a contractor's software and related documentation.

The application of the regulation's provisions regarding software procurement often differ depending on the type of software, the nature of the procurement and the government entity involved. Different branches

of the government have specific regulations under the Federal Acquisition Regulation.

RESTRICTED, LIMITED AND UNLIMITED RIGHTS

The government's rights in software and documentation fall into three categories: restricted rights, limited rights and unlimited rights. These categories establish both the government's rights to use software and documentation and its obligations to protect such assets.

In general, restricted rights provide the greatest proprietary protection and are available only for software, not for documentation. Limited

rights provide less protection than restricted rights and are available only for documentation. Unlimited rights provide very little if any protection and may apply to both software and documentation.

RESTRICTED RIGHTS

Only software developed at private expense not in the public domain and not previously provided to the government with unlimited rights is eligible for restricted rights. Software developed initially at private expense but subsequently completed or modified under government funding will be ineligible for restricted rights treatment with respect to the portions compl-

ed or modified under such funding—and possibly the entire software. Except for one instance discussed below, documentation is never eligible for restricted rights.

Under restricted rights, the government receives a minimum of four rights: the right to use the software with a designated computer; the right to use the software on a backup computer if the designated computer becomes inoperative; the right to copy the software for backup and archive purposes; and the right to modify the software provided that certain portions of the modified software remain subject to restricted rights. A contractor may not deny the government any of these rights.



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COMPUTER INDUSTRY

The parties may, however, agree upon restrictions regarding the exercise of such rights.

LIMITED RIGHTS

Subject to several statutory exclusions, unpublished documentation, as defined under the Federal Acquisition Regulation, that relates to restricted rights software is automatically eligible for limited rights. All other documentation must be identified and agreed to in the pertinent government contract as being subject to limited rights to receive such a classification.

In general, limited rights documentation may be used, duplicated or disclosed by or for the government so long as the documentation is not, without the contractor's written permission, used to prepare similar software, released outside the government or used by a party other than the government. Because limited rights provide less protection than restricted rights, a contractor should be very cautious about placing trade secrets, particularly source code, in its documentation.

UNLIMITED RIGHTS

Unlimited rights can apply to either software or documentation and will apply whenever a contractor fails to comply with the regulation's requirements relating to perfecting limited or restricted rights or whenever software or documentation is ineligible for restricted or limited rights.

Unlimited rights normally attach to all documentation or software prepared under government funding. Note, however, that government-funded software and documentation developed by small businesses under small business innovation research programs may receive a hybrid form of proprietary protection falling in between restricted rights and unlimited rights.

The government may use, duplicate or disclose unlimited rights software or documentation in any manner, for any purpose, and permit others to do so. Once the government receives unlimited rights to software or documentation, it cannot be charged an additional license fee for subsequent copies of the software. In short, granting the government unlimited rights to software or documentation shows an apparent abandonment of any trade secrets contained within and may serve to erode the overall commercial value of the product.

RESTRICTED RIGHTS

OR LIMITED RIGHTS

Even though software and documentation may satisfy the requirements for receiving restricted and limited rights, a contractor is required by the Federal Acquisition Regulation to take certain steps to ensure that such protection attaches to its product. Failure to take such steps may confer unlimited rights upon the government regarding the software or documentation.

To ensure the government receives only restricted rights to software, the attendant government contract, or a separate license agreement incorporated therein, must expressly identify the software subject to restricted rights.

The software must be marked with the following legend prior to delivery to the government:

"RESTRICTED RIGHTS LEGEND

Use, duplication or disclosure is subject to restrictions stated in Contract No. [number] with [name of contractor]."

The software's attendant documentation must contain a prominent statement of the restrictions applicable to the software as such restrictions appear in the contract. The statement must not contain any restrictions not appearing in the contract.

To ensure that the government receives only limited rights in documentation, the contractor must list in the government contract all documentation that has been published or does not

pertain to restricted rights software.

The Federal Acquisition Regulation requires that a contractor must identify, by circling, underlining or so on, each individual portion of its documentation that is to be subject to limited rights.

Failure to comply with the regulation may enable the government to receive broad rights regarding software.

The method used to so identify such portions must be explained in the following legend, which must be affixed to the software documentation:

"LIMITED RIGHTS LEGEND

Contract No. _____
Contractor _____
Explanation of Limited Rights Data Identification Method Used _____

COMMERCIAL COMPUTER SOFTWARE

The Federal Acquisition Regulation provides a modified form of restricted rights protection for "commercial computer software and related documentation" that is privately developed and not in the public domain.

Commercial software includes software used for other than government purposes and that is distributed to the public in significant quantities at market prices.

Characteristics of this protection are that documentation receives protection greater than limited rights; fewer markings are required (a modified form of restricted rights legend must be applied to software and documentation); and the software and documentation need not be identified in the contract as previously discussed.

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COMPUTER INDUSTRY

Firm guilty of illegal export

By Wilfrid Setts

WASHINGTON, D.C. — A Spanish electronics firm has been fined \$1 million, given five years of probation and temporarily denied its U.S. export privileges for illegally diverting U.S. electronics equipment to the Soviet Union and Cuba, the U.S. Department of Commerce said earlier this month.

The firm, Fiber Semiconductor, S.A. of Barcelona, Spain, pleaded guilty to what the government called an "elaborate deception scheme." The fine was levied by Judge Thomas P. Jackson in U.S. District Court.

The department's investigation revealed that from 1979 to 1982, Fiber illegally reexported semiconductor

manufacturing and electronic test equipment to Cuba and the Soviet Union. Reexporting sensitive equipment requires the department's authorization. The government charged that Fiber deliberately falsified its export license application by claiming the equipment was for Fiber's use only and would not be reexported.

The firm was stripped of its export privileges in 1982 when the probe began, according to Theodore W. Wu, deputy assistant secretary for export enforcement. "We stopped more than \$1.2 million of semiconductor manufacturing equipment from getting to the [Soviet Union] by intercepting shipments poised for illegal export," Wu added.

Electronic publishing systems show hosts myriad exhibitors

NEW YORK — The second Corporate Electronic Publishing Systems show held recently brought together exhibitors of all manners of publishing equipment, from full-scale electronic publishing systems to laser printers.

It was difficult at times in the crowd of vendors to find attendees on the exhibit floor.

Showgoers were investigating the possibilities that in-house publishing offers. "Cataloging is very expensive," said Anthony Damiano, controller of Alpha Wire Corp. in Elizabeth, N.J. Damiano does not use in-house publishing and doubts that

it will become a reality for his firm in the next couple of years, but he is "thinking about it," he said.

Technical documentation needs prompted a Wang Laboratories, Inc. graphics and imaging systems product manager to check out the show. In three months, Wang will implement a system for in-house publishing, he said. The manager is looking for the proper way to approach publishing and is trying to see where the market is going with an eye toward not only using a system in-house but perhaps selling such publishing equipment for Wang systems.

"We are contemplating [buying] publishing equipment," said V. J. Bruno, manager of security for Grumman Aerospace Corp. in Bethpage, N.Y. When the company goes to electronic publishing in about a year, he will be responsible for the security of system software and hardware.

— Donna Raimondi

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UNIX Overview	Oct 8-11 Nov 12-15 Dec 16-19 Jan 20-23 Feb 24-27 Mar 28-31 Apr 1-4	Dec 17-19 Jan 20-22 Feb 23-25 Mar 26-28 Apr 29-31 May 3-5 Jun 4-6	Nov 18-20 Dec 19-21 Jan 22-24 Feb 25-27 Mar 28-30 Apr 1-3 May 4-6	Oct 15-18 Nov 19-22 Dec 23-26 Jan 27-30 Feb 2-5 Mar 6-9 Apr 10-13	Oct 15-18 Nov 19-22 Dec 23-26 Jan 27-30 Feb 2-5 Mar 6-9 Apr 10-13	Oct 15-18 Nov 19-22 Dec 23-26 Jan 27-30 Feb 2-5 Mar 6-9 Apr 10-13	Oct 15-18 Nov 19-22 Dec 23-26 Jan 27-30 Feb 2-5 Mar 6-9 Apr 10-13	1600
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COMPUTER INDUSTRY

From page 135

Earning at Honeywell, Burroughs down

firm's results "below our expectations and a disappointment."

Among other major systems vendors, Wang Laboratories, Inc. posted a small profit after its record second-quarter loss; earnings at Cray Research, Inc. declined slightly although sales grew by 38%, and the slump at Gould, Inc. continued with a 29% drop in its third-quarter net.

■ **Honeywell.** Edson Spencer, chairman and chief executive officer of the Minneapolis-based vendor, said a 6.7% drop in earnings from continuing operations was partially attributable to falling orders in Honeywell's computer business, the Information Systems Division. Spencer said large systems orders remained ahead of 1984 for the first nine months of 1985, but the volume of small systems orders "continued to be weak."

Honeywell earned \$55.7 million, or \$1.24 per share, during the quarter, down from \$59.7 million, or \$1.28 per share, from continuing operations a year ago. The 1984 figure excludes a nonrecurring \$40 million gain from tax law changes. Third-quarter revenue was \$1.35 billion, up 6.1% from \$1.26 billion in the year-earlier quarter. Profits for the first nine months of 1985 lagged 1984 by 25.5%, with revenue 6.3% ahead of last year.

■ **Burroughs.** While sales edged up 2% to \$1.16 billion, profits

dropped from \$50.2 million, or \$1.11 per share, in the third quarter last year to \$32.2 million, or 71 cents per share.

Blumenthal said half of the drop came within Memorex, owing to 3680 disk drive cost overruns, lower than expected disk storage volume and falling prices on IBM plug-compatible peripherals.

Blumenthal said domestic computer hardware sales continued to be sluggish, noting an "unexpected volume shortfall" in September.

For the first three quarters, Burroughs was 7.5% ahead of 1984's pace in revenue and 11.7% behind in earnings. Nine-month profits have fallen from \$3.32 per share to \$2.93.

■ **Wang.** As reported in its preliminary announcement (CW, Oct. 14), the Lowell, Mass., office automation leader returned to the black after its

disastrous June-ending quarter, in which the firm lost \$109 million and laid off more than 1,500 workers.

For the first quarter of its fiscal year 1986, Wang earned \$7 million, or 5 cents per share, on \$560.9 million in revenue. The revenue constituted a 1.3% increase from \$553.8 million a year ago, when the company made a profit of \$51.2 million, or 36 cents per share.

A spokesman said Wang received \$699 million in new orders, a company record for one quarter, but that profit margins continued to be depressed by falling hardware prices.

■ **Cray Research.** The Minneapolis supercomputer maker posted a 2.5% drop in earnings to \$19.1 million from \$19.6 million a year ago, despite a 38.9% revenue increase. Per-share earnings slipped from 66 cents last year to 63 cents.

The 1984 figure, however, included a \$5.9 million, 20 cent per share deferred income tax credit. Cray's year-to-year pretax profit growth was 50.7%, from \$25.6 million to \$35.6 million.

Cray Chairman John A. Rollwagen said customers purchased five Cray supercomputers in the quarter, compared with two systems sold and one leased in the year-earlier quarter. He predicted the firm will sell five systems and lease five others in the fourth quarter.

■ **Gould.** The Rolling Meadows, Ill., vendor of chips, computers, defense systems and other electronic products reported a 29% decline in profits, from \$22.5 million, or 50 cents per share, a year ago to \$15 million, or 36 cents per share. Revenue dropped from \$390.3 million to \$361.6 million.

From page 135

MCI moves closer to SBS buyout

IBM also has the right to acquire additional MCI shares up to 30% of the common stock without MCI board approval.

MCI said IBM has also agreed under certain conditions to invest an additional \$400 million in MCI between Sept. 1, 1986 and Dec. 31, 1988. An MCI spokesman said the conditions stated that MCI would ask IBM to invest the money at a time of its own choosing.

The proposed takeover of SBS' assets by MCI will now be submitted to the Federal Communications Commission for approval.

MERGERS AND ACQUISITIONS

■ **Bell & Howell Co.** announced that it has acquired a 48% share in Quinstar Corp. for \$1.4 million. Bell & Howell purchased its shares from Matrix Corp. and the remainder from Quinstar Corp.

■ **Decision Data Computer Corp.'s** wholly owned subsidiary Decision Data Service, Inc. has announced it has acquired the field service business of Twentieth Century Computer Maintenance, Inc.

■ **Anacom, Inc.** has announced its acquisition of the customer base of three micrographics processing centers from Kalvar, Inc. In exchange for the centers, Anacom delivered securities and a note held by Anacom to Kalvar.

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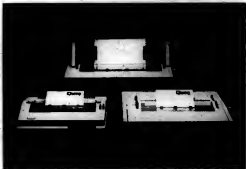
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COMPUTER INDUSTRY

From page 135

Stratus, Compaq post revenue increases

cents per share, compared with \$1.9 million, or 7 cents per share, a year ago. Revenue grew 50% from \$57.6 million to \$131.7 million.

As expected, Compaq President Rod Canion attributed much of the growth to the success of the Compaq Deskpro 286 and Portable 286, which are compatible with and lower priced than the IBM Personal Computer AT.

Other third-quarter results announced recently include the following:

■ **Tandy Corp.** The micro and laptop computer vendor posted a 12% gain in profits on 16% revenue growth for its first quarter ended Sept. 30. Tandy earned \$41.7 million, or 47 cents per share, on \$699.5 million in sales.

■ **Computer Consoles, Inc.** Former Wang Laboratories, Inc. President John Cunningham has not turned the Rochester, N.Y., minicomputer vendor around yet. The firm posted another losing quarter with a loss of \$4.2 million, or 37 cents per share, on revenue of 25.4 million. A year earlier, the company earned \$1.4 million, or 12 cents per share, on

\$33.3 million in sales.

■ **Intecom, Inc.** The Wang data communications partner posted a steep decline in profits from \$4.9 million, or 16 cents per share, a year ago to \$832,000, or 3 cents per share. Sales fell from \$40 million to \$32.7 million.

■ **Ungermann-Bass, Inc.** The Santa Clara, Calif., local-area network leader saw its earnings drop despite a 43% rise in revenue from \$13.3 million to \$19 million. Expenses kept pace with sales, jumping from \$11.3 million to \$18.3 million. Ungermann-Bass earned \$1.3 million, or 8 cents per share, compared with \$1.7 million, or 11 cents per share, a year ago.

■ **Computer Solutions Corp.** The El Segundo, Calif., vendor of systems and services posted a profit gain of 43% from \$3.4 million, or 25 cents per share, to \$4.9 million, or 34 cents

per share. Revenue increased to \$206.3 million from \$172 million in the year-earlier quarter.

■ **Compugraphic Corp.** The Wilmington, Mass., vendor of automated publishing systems attributed a third-quarter drop in profits and earnings to slowed capital spending in the U.S. and no pickup in overseas orders to accompany the weakened dollar. Compugraphic earned \$4.1 million, or 50 cents per share, on \$64 million in revenue, compared with \$6.5 million, or 79 cents per share, on \$101.3 million in sales a year ago. The firm laid off 5% of its work force last month.

■ **Seagate Technology, Inc.** Bucking the downward trend in the peripherals market, the Scotts Valley, Calif., Winchester disk drive maker boosted its revenue 78% from the year-earlier quarter and posted a

modest profit. Seagate earned \$1.6 million, or 4 cents per share, compared with a \$423,000, 1 cent per share, loss in the year-earlier period. With 49% of its sales going to IBM, Seagate increased its revenue from \$50.6 million a year ago to \$90.3 million.

■ **Daley Systems Corp.** The Mountain View, Calif., computer-aided design workstation vendor said fourth-quarter profits increased from \$3.6 million, or 23 cents per share, to \$6.9 million, or 35 cents per share. Revenue increased 63% to \$36.5 million.

For the fiscal year ended Sept. 30, Daley Systems posted a 77% revenue increase from \$69.1 million in the prior year to \$122.8 million. Profits jumped from \$11.4 million, or 78 cents per share, to \$20.5 million, or \$1.18 per share.

From page 135

Mostek closing its doors

trouble since the beginning of the year, losing approximately \$330 million and laying off two-thirds of its 10,000 employees. Susan Kelly of Dataquest, Inc. said only the financial backing of United Technologies, one of the nation's largest defense contractors, kept Mostek from closing sooner.

Kelly predicted two companies in California's Silicon Valley, Viscitec Corp. and Zilog, Inc., would attempt to contract for production that had been done by Mostek.

In conjunction with the closing, United Technologies also announced that it will sell its telecommunications business, which focused on the private branch exchange market. The combined effect of the two moves cost the firm \$423.7 million, resulting in a net loss of \$45.6 million in the third quarter. United Technologies earned \$192.7 million in the third quarter a year ago.

Elsewhere in the semiconductor industry, the pattern of generally dismal results continued. Seeq Technology, Inc. of San Jose, Calif., announced the layoff of 75 of its 450 employees.

Seeq posted a loss of \$6.3 million for the quarter and \$10 million for the year ended Sept. 30. This marked the second straight losing year for Seeq, which finished \$3.7 million in the red in fiscal 1984. Year-to-year revenue declined from \$42.9 million to \$40.3 million.

Separately, chip maker Exar Corp. of Sunnyvale, Calif., dismissed 60 of its 600 employees and LTX Corp. of Westwood, Mass., a maker of semiconductor test equipment, announced the layoff of 250 employees.

Illustrating another industrial sector that has been hit hard by the technology slowdown, LTX President Graham Miller said the test equipment firm's orders for the three-month period ending this week were running 20% to 30% behind the previous quarter.

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COMPUTER INDUSTRY

From page 135

Opinions on slump abound

Applied Data Research, Inc. (ADR) Chairman and Chief Executive Officer John E. Bennett predicted a fourth-quarter pickup in ADR sales. "Many of our large accounts say they haven't bought yet but will before the year is out," he said. "There is a lot of uncertainty right now."

Despite a slight profit in

the third quarter [CW, Oct. 21] thanks to a \$6.5 million contract from the U.S. Army, ADR has lost \$2.3 million in the first nine months this year. "After last year we decided to budget for 45% growth, and our expenses were right on target," Bennett said. "We are planning for no expense growth in 1986." ADR instituted a hiring freeze last July.

Bennett said all independent software companies are allies in the market share

battle against IBM's DB2 and its monthly license fee structure. "Competing against that 30-day trial option, our [relational data base management system] is \$300,000, and we're still selling it," he said. "But we have to look at making our software easier to buy."

Bennett predicted that the adverse effect of the New Jersey State Department of Motor Vehicles' problems with ADR's Ideal software [CW, Sept. 30] would be tem-

porary, but thought that perhaps the whole snafu may serve an educational purpose in the end. "The discussion needs to be elevated to an examination of fourth-generation languages in general," he said.

Bennett claimed ADR users still stand behind Ideal. "When we talked about the New Jersey situation at our users group meeting, it was like bad-mouthing Jesus Christ at a religious revival," Bennett said.

Over on New York's Long Island, things are still swimming for Computer Associates International, Inc. Chairman Charles Wang's biggest worry is that analyst/investor types will shy away from the Jericho, N.Y., vendor because the overall industry has slowed down.

What are Computer Associates' secrets of success? According to Wang, they are a favorable product mix (including Sorcim/IUS micro offerings), fixed term licenses (for a recurring revenue based on a 90% renewal rate) and competitive pricing.

Another success story in attendance at Alex Brown, was Software Publishing Corp.'s youthful president, Fred Gibbons. Software Publishing's first venture into the high-ticket micro software market with its recent acquisition of Harvard Software, Inc. will be interesting to watch. Software Publish-

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'If (VM Software) weren't \$800,000 and 19 people below last year's expense level, we'd be in trouble.'

—Robert E. Cook
VM Software, Inc.

ing, incidentally, jettisoned virtually all of the Littleton, Mass., firm's employees, except very top management, after the buyout.

Gibbons said that Software Publishing's trademark PFS series will show a sales breakdown of 70% IBM to 30% Apple Computer, Inc. versions in the current year and predicted that the mix will shift to 90%-10%, respectively, in fiscal 1986. Just one more plug for Apple as "the educational computer company."

AGS Computers, Inc., the 18-year-old Mountainside, N.J., firm offering a mixed bag of systems integration, distribution and consulting, reported that IBM is now its second largest customer, behind AT&T. In the past year, Big Blue vaulted over Digital Equipment Corp. and Wang Laboratories, Inc. to earn that position.

As for IBM itself, well, some things never change. John E. Steuri, boss of IBM's Information Services Division, had just wrapped up an extensive presentation on the division's offerings and directions to a large Alex Brown audience when an analyst asked the \$64 million (this is IBM we're talking about) question. Could Steuri break out the division's current revenue?

Steuri paused for a moment and replied, "Are you from the trade press?"

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technical minds—people capable of applying present technology to the future. Of looking forward, pushing limits. Creating ways to apply new hardware and software. Central to our success is our ability to integrate new developments in the rapidly evolving science of communications. The following positions represent an opportunity to play a key role in the development of our services—ways you can become one of the bold pioneers creating new boundaries of networking technology.

TELECOMMUNICATIONS SPECIALISTS

Openings are available for this position throughout the United States to install and maintain sophisticated telecommunications equipment. You must have an AS degree or equivalent in Computer Technology or Electronics, a knowledge of earth stations and/or switching nodes (Tandem and/or Rockwell/Collins equipment preferred), and familiarity with communications protocols such as X.25 and HDLC. Practical knowledge of voice grade and DDS data circuits is also required.

SR. TELECOMMUNICATIONS ANALYST

You will coordinate installations of major telecommunications systems and provide expertise in evaluating telecommunications problems and isolate specific hardware, software or transmission component problems. You must have a Bachelor's degree or equivalent in Business, Math or Engineering with four years professional experience in the design and development of major telecommunications projects. Knowledge or experience in circuit administration, CCITT standards and practices, business/strategic planning, tariff and regulatory matters and/or traffic accounting and settlements required along with frequent international travel.

SR. TELECOMMUNICATIONS ENGINEER

You will design programmable communications interfaces for various protocols (i.e. X.25, mobile satellite, SDLC/SDMA, etc.). A Bachelor's degree or equivalent in Electrical Engineering or Computer Science and four years professional experience in telecommunications or computer systems engineering and training are required. You must have a thorough knowledge of microcomputer hardware and software and good communication skills. Experience in computer hardware, programming or data transmission is preferred.

TELECOMMUNICATIONS ENGINEER/RADIO

You will design and maintain corporate/field radio communications network, assuring user requirements and operational efficiency are met. A Bachelor's degree in Electrical Engineering plus 2nd class commercial radio telephone license or equivalent is required. You must have two years professional experience in the area of business band FM radio communications and Digital Systems, and be able to travel to field stations.

CHIEF ENGINEER/NETWORK DEVELOPMENT

You will provide unique technical expertise in performing design and development of advanced telecommunications systems; develop telecommunications strategies to support corporate objectives, and ensure cost effective network systems. A Bachelor's degree or equivalent in Engineering, Computer Science or related field is required; Master's degree is preferred. You must have eight years professional data communications or computer systems experience, including five years experience in data communications planning, development or engineering. Knowledge of communications transport protocols and interfaces is required along with the demonstrated ability to work with broadly defined goals.

CHIEF ENGINEER/ GROUND SEGMENT ENGINEERING

You will ensure the design and development of all earth stations, control centers, and related programs as part of the space-based communication system for voice, data, video and image traffic. You must have seven years engineering experience, including design and development of space-based communications systems, and experience in program management/leadership of space-based systems from design to operation.

PROJECT ENGINEER/ NETWORK DEVELOPMENT

You will design and develop advanced telecommunications systems and develop telecommunications strategies to support corporate objectives and ensure cost-effective network systems. A Bachelor's degree in Engineering, Computer Science or a related field is required. Master's degree is preferred. You must have six years professional experience in data communications or computer systems, including three years in data communications planning, development or engineering. Knowledge of communications transport protocols and interfaces is

required along with the demonstrated ability to work with broadly defined goals.

SR. OPERATIONS ANALYST

You will analyze ZapMail operations in order to recommend resource and procedural changes, develop and implement computer-based management decision systems; and analyze and make recommendations for ZapMail network expansion. You must have a Bachelor's degree or equivalent in Math, Computer Science, Engineering or a related discipline. MBA is preferred. Four years professional experience in financial/operational analysis and/or design of computer-based decision systems is required along with knowledge of computer modeling using scientific or statistical programming languages.

SR. ENGINEER/SOFTWARE

You will plan, design, code, test and implement software and firmware for use in electronic mail applications. A Bachelor's degree or equivalent in Electrical Engineering, Computer Science, Math or Physics is required along with five years systems programming experience with microcomputers or microprocessors. A Master's degree is preferred. You must be proficient in real-time assembly language programming as well as high level (BASIC, PL-1, FORTRAN, PASCAL) language programming.

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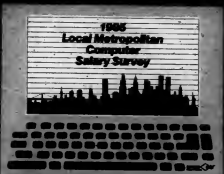
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